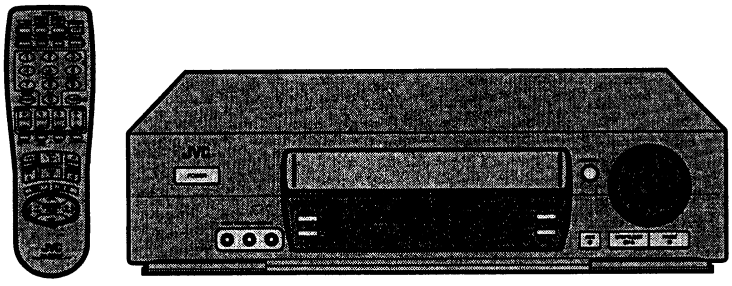
VIDE-V24351

JVC

SERVICE MANUAL

VIDEO CASSETTE RECORDER

HR-VP670U



Hi-Fi VHS
SQPB
VCR plus+®
Easy Taping.
MOVIE▸▸ADVANCE™

SPECIFICATIONS *(The specifications shown pertain specifically to the model HR-VP673U)*

GENERAL

Power requirement	: AC 120 V∿ , 60 Hz
Power consumption	
Power on	: 19 W
Power off	: 2.5 W
Temperature	
Operating	: 5°C to 40°C (41°F to 104°F)
Storage	: –20°C to 60°C (–4°F to140°F)
Operating position	: Horizontal only
Dimensions (W x H x D)	: 400 x 94 x 275 mm (15-3/4" x 3-3/4" x 10-7/8")
Weight	: 3.2 kg (7.1 lbs)
Format	: VHS NTSC standard
Maximum recording time	
SP	: 210 min. with ST-210 video cassette
EP	: 630 min. with ST-210 video cassette

VIDEO/AUDIO

Signal system	: NTSC-type color signal and EIA monochrome signal, 525 lines/60 fields
Recording/ Playback system	: DA-4 (Double Azimuth) head helical scan system
Signal-to-noise ratio	: 45 dB
Horizontal resolution	: 240 lines
Frequency range	
Normal audio	: 70 Hz to 10,000 Hz
Hi-Fi audio	: 20 Hz to 20,000 Hz
Input/Output	: RCA connectors (IN x 1, OUT x 1)

TUNER

Tuning system	: Frequency-synthesized tuner
Channel coverage	
VHF	: Channels 2–13
UHF	: Channels 14–69
CATV	: 113 Channels
RF output	: Channel 3 or 4 (switchable; preset to Channel 3 when shipped) 75 ohms, unbalanced

TIMER

Clock reference	: Quartz
Program capacity	: 1-year programmable timer/ 8 programs
Memory backup time	: Approx. 10 min.

ACCESSORIES

Provided accessories	: RF cable (F-type), Infrared remote control unit, "AA" battery x 2

Specifications shown are for SP mode unless otherwise specified.
E. & O.E. Design and specifications subject to change without notice.

COPYRIGHT © 1999 VICTOR COMPANY OF JAPAN, LTD.

No. 82706
February 1999

TABLE OF CONTENTS

Section Title Page

Important Safety Precautions

INSTRUCTIONS (HR-VP473U and HR-VP673U)

1. DISASSEMBLY

1.1 DISASSEMBLY FLOW CHART 1-1
1.2 HOW TO READ THE DISASSEMBLY AND ASSEMBLY 1-1
1.3 DISASSEMBLY/ASSEMBLY METHOD 1-1
1.4 SERVICE POSITION 1-4
 1.4.1 How to take out the Mechanism and Main board assemblies 1-4
1.5 MECHANISM SERVICE MODE 1-5
 1.5.1 How to set the "MECHANISM SERVICE MODE" 1-5
1.6 EMERGENCY DISPLAY FUNCTION 1-6
 1.6.1 How to display record of an emergency faults 1-6
 1.6.2 Detail of emergency faults 1-6
 1.6.3 How to clear emergency record 1-6
1.7 SYSCON CIRCUIT 1-7
 1.7.1 Syscon CPU pin function (IC3001) 1/2 1-7
 1.7.2 Syscon CPU pin function (IC3001) 2/2 1-8

2. MECHANISM ADJUSTMENT

2.1 BEFORE STARTING REPAIR AND ADJUSTMENT 2-1
 2.1.1 Precautions 2-1
 2.1.2 Checking for Proper Mechanical Operations 2-1
 2.1.3 Manually Removing the Cassette Tape 2-1
 2.1.4 Jigs and Tools Required for Adjustment 2-3
 2.1.5 Maintenance and Inspection 2-3
2.2 REPLACEMENT OF MAJOR PARTS 2-6
 2.2.1 Before Starting Disassembling (Phase matching between mechanical parts) 2-6
 2.2.2 How to Set the Mechanism Assembling Mode 2-7
 2.2.3 Cassette Holder Assembly 2-7
 2.2.4 Pinch Roller Arm Assembly 2-10
 2.2.5 Guide Arm Assembly and Press Lever Assembly 2-10
 2.2.6 Audio Control Head 2-10
 2.2.7 Loading Motor 2-11
 2.2.8 Capstan Motor 2-11
 2.2.9 Pole Base Assembly (supply or take-up side) 2-12
 2.2.10 Rotary Encoder 2-12
 2.2.11 Clutch Unit 2-13
 2.2.12 Change Lever Assembly, Direct Gear and Clutch Gear1 2-13
 2.2.13 Link Lever 2-13
 2.2.14 Cassette Gear, Control Cam and Worm Gear 2-14
 2.2.15 Control Plate 2-14
 2.2.16 Loading Arm Gear (supply or take-up side) and Loading Arm Gear Shaft 2-15
 2.2.17 Take-up Lever, Take-up Head and Control Plate Guide 2-16
 2.2.18 Capstan Brake Assembly 2-17
 2.2.19 Sub Brake Assembly (take-up side) 2-17
 2.2.20 Main Brake Assembly (take-up side), Reel Disk (take-up side) and Main Brake Assembly (supply side) 2-17
 2.2.21 Tension Brake Assembly, Reel Disk (supply side) and Tension Arm Assembly 2-18
 2.2.22 Idler Lever, Idler Arm Assembly 2-18
 2.2.23 Stator Assembly 2-18
 2.2.24 Rotor Assembly 2-19
 2.2.25 Upper Drum Assembly 2-19
2.3 COMPATIBILITY ADJUSTMENT 2-20
 2.3.1 Checking/Adjustment of FM Waveform Linearity 2-20
 2.3.2 Checking/Adjustment of the Height and Tilt of the Audio Control Head 2-22
 2.3.3 Checking/Adjustment of the Audio Control Head Phase (X-Value) 2-22
 2.3.4 Checking/Adjustment the Standard Tracking Preset 2-23
 2.3.5 Checking/Adjustment of the Tension Pole 2-23
 2.3.6 Adjustment of the Tension Stud 2-23
 2.3.7 Main Brake Torque Adjustment 2-23

3. ELECTRICAL ADJUSTMENT

3.1 PRECAUTION 3-1
 3.1.1 Required test equipment 3-1
 3.1.2 Required adjustment tools 3-1
 3.1.3 Color bar signal,color bar pattern 3-1
3.2 SERVO CIRCUIT 3-2
 3.2.1 PB switching point 3-2
 3.2.2 Slow tracking preset 3-2
3.3 DEMODULATOR CIRCUIT 3-3
 3.3.1 Input level 3-3
 3.3.2 Stereo VCO 3-3
 3.3.3 Stereo filter 3-3
 3.3.4 Separation - 1 3-4
 3.3.5 Separation - 2 3-4
 3.3.6 SAP VCO 3-4
3.4 VIDEO CIRCUIT 3-4
 3.4.1 Auto picture 3-4

4. CHARTS AND DIAGRAMS

NOTES OF SCHEMATIC DIAGRAM 4-1
CIRCUIT BOARD NOTES 4-2
4.1 BOARD INTERCONNECTIONS 4-3
4.2 VIDEO/N.AUDIO SCHEMATIC DIAGRAM 4-5
4.3 FMA SCHEMATIC DIAGRAM 4-7
4.4 SYSTEM CONTROL SCHEMATIC DIAGRAM 4-9
4.5 SWITCHING REGULATOR SCHEMATIC DIAGRAM 4-11
4.6 TUNER SCHEMATIC DIAGRAM 4-13
4.7 SW/DISPLAY SCHEMATIC DIAGRAM 4-15
4.8 MOVIE ADVANCE SCHEMATIC DIAGRAM 4-17
4.9 MAIN AND A/C HEAD CIRCUIT BOARDS 4-21
4.10 FDP GRID ASSIGNMENT AND ANODE CONNECTION 4-23
4.11 REMOTE CONTROL SCHEMATIC DIAGRAM 4-24
4.12 VOLTAGE CHARTS 4-25
4.13 SYSTEM CONTROL BLOCK DIAGRAM 4-27
4.14 VIDEO BLOCK DIAGRAM 4-29
4.15 AUDIO BLOCK DIAGRAM 4-31

5. PARTS LIST

5.1 PACKING AND ACCESSORY ASSEMBLY <M1> 5-1
5.2 CABINET AND CHASSIS ASSEMBLY <M2> 5-2
5.3 MECHANISM ASSEMBLY <M4> 5-4
5.4 ELECTRICAL PARTS LIST 5-6
 MAIN BOARD ASSEMBLY <03> 5-6
 AUDIO CONTROL HEAD BOARD ASSEMBLY <12> 5-11
 LOADING MOTOR BOARD ASSEMBLY <55> 5-11

The following table lists the differing points between Models (HR-VP670U/U(C), HR-VP672U and HR-VP673U/U(C)) in this series.

	HR-VP670U/U(C)	HR-VP672U	HR-VP673U/U(C)
BEST SYSTEM	AUTO PICTURE	ACTIVE VIDEO CALIBRATION	ACTIVE VIDEO CALIBRATION
CHILD LOCK	NOT USED	USED	USED

Important Safety Precautions

Prior to shipment from the factory, JVC products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

●Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▨) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Fuse replacement caution notice.
   Caution for continued protection against fire hazard.
   Replace only with same type and rated fuse(s) as specified.

4. Use specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

5. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape 3) Spacers 5) Barrier
   2) PVC tubing 4) Insulation sheets for transistors

6. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.

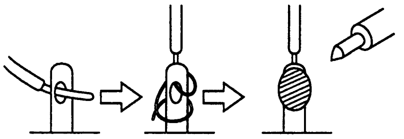


Fig.1

7. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

8. Check that replaced wires do not contact sharp edged or pointed parts.

9. When a power cord has been replaced, check that 10-15 kg of force in any direction will not loosen it.

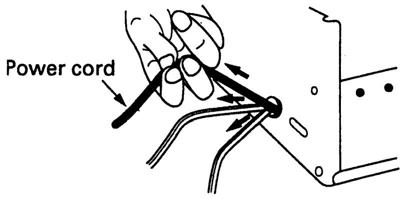


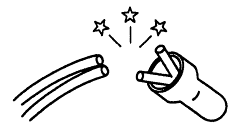
Fig.2

10. Also check areas surrounding repaired locations.

11. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the specified parts. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

12. Crimp type wire connector
    In such cases as when replacing the power transformer in sets where the connections between the power cord and power transformer primary lead wires are performed using crimp type connectors, if replacing the connectors is unavoidable, in order to prevent safety hazards, perform carefully and precisely according to the following steps.

    1) **Connector part number** : E03830-001
    2) **Required tool** : Connector crimping tool of the proper type which will not damage insulated parts.
    3) **Replacement procedure**
       (1) Remove the old connector by cutting the wires at a point close to the connector.
       Important : Do not reuse a connector (discard it).



cut close to connector

Fig.3

(2) Strip about 15 mm of the insulation from the ends of the wires. If the wires are stranded, twist the strands to avoid frayed conductors.

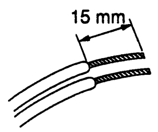


Fig.4

(3) Align the lengths of the wires to be connected. Insert the wires fully into the connector.

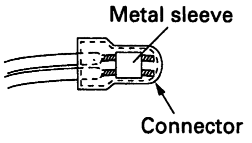


Fig.5

(4) As shown in Fig.6, use the crimping tool to crimp the metal sleeve at the center position. Be sure to crimp fully to the complete closure of the tool.

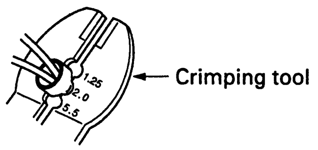


Fig.6

(5) Check the four points noted in Fig.7.

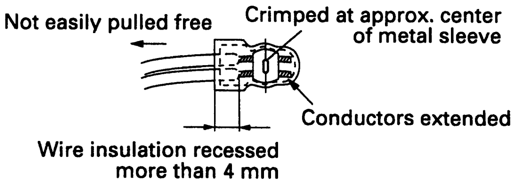

Not easily pulled free
Crimped at approx. center of metal sleeve
Conductors extended
Wire insulation recessed more than 4 mm

Fig.7

• Safety Check after Servicing

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions, Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

1. **Insulation resistance test**
   Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

2. **Dielectric strength test**
   Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.). See table 1 below.

3. **Clearance distance**
   When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table 1 below.

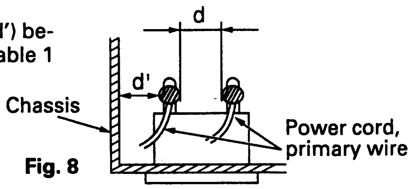


Fig. 8

4. **Leakage current test**
   Confirm specified or lower leakage current between earth ground/power cord plug prongs and externally exposed accessible parts (RF terminals, antenna terminals, video and audio input and output terminals, microphone jacks, earphone jacks, etc.).
   Measuring Method : (Power ON)
   Insert load Z between earth ground/power cord plug prongs and externally exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure 9 and following table 2.

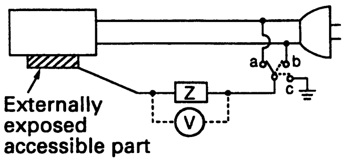


Fig. 9

5. **Grounding (Class I model only)**
   Confirm specified or lower grounding impedance between earth pin in AC inlet and externally exposed accessible parts (Video in, Video out, Audio in, Audio out or Fixing screw etc.).
   Measuring Method:
   Connect milli ohm meter between earth pin in AC inlet and exposed accessible parts. See figure 10 and grounding specifications.

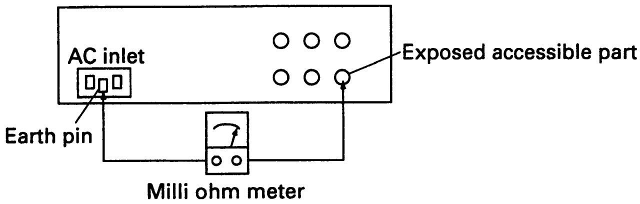


Fig. 10

Grounding Specifications

Region	Grounding Impedance (Z)
USA & Canada	Z ≦ 0.1 ohm
Europe & Australia	Z ≦ 0.5 ohm

AC Line Voltage	Region	Insulation Resistance (R)	Dielectric Strength	Clearance Distance (d), (d')
100 V	Japan	R ≧ 1 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3 mm
100 to 240 V			AC 1.5 kV 1 miute	d, d' ≧ 4 mm
110 to 130 V	USA & Canada	1 MΩ ≦ R ≦ 12 MΩ/500 V DC	AC 1 kV 1 minute	d, d' ≧ 3.2 mm
110 to 130 V 200 to 240 V	Europe & Australia	R ≧ 10 MΩ/500 V DC	AC 3 kV 1 minute (Class II) AC 1.5 kV 1 minute (Class I)	d ≧ 4 mm d' ≧ 8 mm (Power cord) d' ≧ 6 mm (Primary wire)

Table 1 Specifications for each region

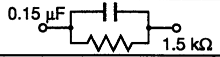
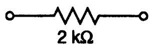
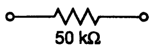
AC Line Voltage	Region	Load Z	Leakage Current (i)	a, b, c
100 V	Japan	1 kΩ	i ≦ 1 mA rms	Exposed accessible parts
110 to 130 V	USA & Canada	 0.15 µF 1.5 kΩ	i ≦ 0.5 mA rms	Exposed accessible parts
110 to 130 V 220 to 240 V	Europe & Australia	 2 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Antenna earth terminals
		 50 kΩ	i ≦ 0.7 mA peak i ≦ 2 mA dc	Other terminals

Table 2 Leakage current specifications for each region

Note: These tables are unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

INSTRUCTIONS [This instruction manual is for HR-VP473U and HR-VP673U]

Dear Customer,
Thank you for purchasing the JVC VHS video cassette recorder. Before use, please read the safety information and precautions contained in the following pages to ensure safe use of your new VCR.

CAUTIONS

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK.
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

WARNING:
TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS UNIT TO RAIN OR MOISTURE.

CAUTION:
This video cassette recorder should be used with AC 120V∿, 60Hz only.
To prevent electric shocks and fire hazards, DO NOT use any other power source.

CAUTION:
TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

ATTENTION:
POUR ÉVITER LES CHOCS ÉLECTRIQUES, INTRODUIRE LA LAME LA PLUS LARGE DE LA FICHE DANS LA BORNE CORRESPONDANTE DE LA PRISE ET POUSSER JUSQU'AU FOND.

Note to CATV system installer:
This reminder is provided to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

CAUTION:
Changes or modifications not approved by JVC could void user's authority to operate the equipment.

Failure to heed the following precautions may result in damage to the VCR, remote control or video cassette.

1. **DO NOT place the VCR . . .**
   - ... in an environment prone to extreme temperatures or humidity.
   - ... in direct sunlight.
   - ... in a dusty environment.
   - ... in an environment where strong magnetic fields are generated.
   - ... on a surface that is unstable or subject to vibration.
2. **DO NOT block the VCR's ventilation openings.**
3. **DO NOT place heavy objects on the VCR or remote control.**
4. **DO NOT place anything which might spill on top of the VCR or remote control.**
5. **AVOID violent shocks to the VCR during transport.**

**MOISTURE CONDENSATION
Moisture in the air will condense on the VCR when you move it from a cold place to a warm place, or under extremely humid conditions—just as water droplets form on the surface of a glass filled with cold liquid. Moisture condensation on the head drum will cause damage to the tape. In conditions where condensation may occur, keep the VCR's power turned on for a few hours to let the moisture dry before inserting a tape.

**ABOUT HEAD CLEANING
Accumulation of dirt and other particles on the video heads may cause the playback picture to become blurred or interrupted. Be sure to contact your nearest JVC dealer if such troubles occur.

VCR Plus+ and PlusCode are registered trademarks of Gemstar Development Corporation.
The VCR Plus+ system is manufactured under license from Gemstar Development Corporation.

DSS™ is an official trademark of DIRECTV, Inc., a unit of GM Hughes Electronics. PRIMESTAR is a registered service mark of Primestar Partners, L.P. DISH Network™ is a trademark of Echostar Communications Corporation.

MOVIE ADVANCE™ is a trademark of SRT, Inc. A Jerry Iggulden invention licensed in association with Arthur D. Little Enterprises, Inc (HR-VP673U only).

- Cassettes marked "VHS" (or "S-VHS") can be used with this video cassette recorder. However, S-VHS recording is not possible with this model.
- This model is equipped with SQPB (S-VHS QUASI PLAYBACK) that makes it possible to play back S-VHS recordings with regular VHS resolution.
- HQ VHS is compatible with existing VHS equipment.
- As an ENERGY STAR® Partner, JVC has determined that this product or product model meets the ENERGY STAR® guidelines for energy efficiency.

IMPORTANT PRODUCT SAFETY INSTRUCTIONS

Electrical energy can perform many useful functions. But improper use can result in potential electrical shock or fire hazards. This product has been engineered and manufactured to assure your personal safety. In order not to defeat the built-in safeguards, observe the following basic rules for its installation, use and servicing.

ATTENTION:
Follow and obey all warnings and instructions marked on your product and its operating instructions. For your safety, please read all the safety and operating instructions before you operate this product and keep this booklet for future reference.

INSTALLATION

1. Grounding or Polarization
(A) Your product may be equipped with a polarized alternating-current line plug (a plug having one blade wider than the other). This plug will fit into the power outlet only one way. This is a safety feature.
If you are unable to insert the plug fully into the outlet, try reversing the plug. If the plug should still fail to fit, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the polarized plug.

(B) Your product may be equipped with a 3-wire grounding-type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature.
If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the safety purpose of the grounding-type plug.

2. Power Sources
Operate your product only from the type of power source indicated on the marking label. If you are not sure of the type of power supply to your home, consult your product dealer or local power company. If your product is intended to operate from battery power, or other sources, refer to the operating instructions.

3. Overloading
Do not overload wall outlets, extension cords, or integral convenience receptacles as this can result in a risk of fire or electric shock.

4. Power Cord Protection
Power supply cords should be routed so that they are not likely to be walked on or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit from the product.

5. Ventilation
Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered.
- Do not block the openings by placing the product on a bed, sofa, rug or other similar surface.
- Do not place the product in a built-in installation such as a bookcase or rack unless proper ventilation is provided or the manufacturer's instructions have been adhered to.

6. Wall or Ceiling Mounting
The product should be mounted to a wall or ceiling only as recommended by the manufacturer.

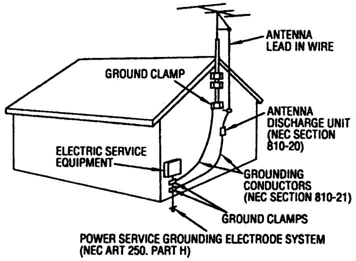
ANTENNA INSTALLATION INSTRUCTIONS

1. Outdoor Antenna Grounding
If an outside antenna or cable system is connected to the product, be sure the antenna or cable system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding connectors, location of antenna discharge unit, connection to grounding electrodes, and requirements for the grounding electrode.

2. Lightning
For added protection for this product during a lightning storm, or when it is left unattended and unused for long periods of time, unplug it from the wall outlet and disconnect the antenna or cable system. This will prevent damage to the product due to lightning and power-line surges.

3. Power Lines
An outside antenna system should not be located in the vicinity of overhead power lines or other electric light or power circuits, or where it can fall into such power lines or circuits. When installing an outside antenna system, extreme care should be taken to keep from touching such power lines or circuits as contact with them might be fatal.

EXAMPLE OF ANTENNA GROUNDING AS PER NATIONAL ELECTRICAL CODE, ANSI/NFPA 70


ANTENNA LEAD IN WIRE
GROUND CLAMP
ANTENNA DISCHARGE UNIT (NEC SECTION 810-20)
ELECTRIC SERVICE EQUIPMENT
GROUNDING CONDUCTORS (NEC SECTION 810-21)
GROUND CLAMPS
POWER SERVICE GROUNDING ELECTRODE SYSTEM (NEC ART 250. PART H)

NEC – NATIONAL ELECTRICAL CODE

USE

1. Accessories

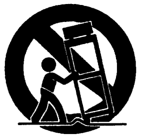
To avoid personal injury:

- Do not place this product on an unstable cart, stand, tripod, bracket, or table. It may fall, causing serious injury to a child or adult, and serious damage to the product.
- Use only with a cart, stand, tripod, bracket, or table recommended by the manufacturer or sold with the product.
- Use a mounting accessory recommended by the manufacturer and follow the manufacturer's instructions for any mounting of the product.
- Do not try to roll a cart with small casters across thresholds or deep-pile carpets.

2. Product and Cart Combination

A product and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the product and cart combination to overturn.

PORTABLE CART WARNING
(Symbol provided by RETAC)



3. Water and Moisture

Do not use this product near water—for example, near a bath tub, wash bowl, kitchen sink or laundry tub, in a wet basement, or near a swimming pool and the like.

4. Object and Liquid Entry

Never push objects of any kind into this product through openings as they may touch dangerous voltage points or short-out parts that could result in a fire or electric shock. Never spill liquid of any kind on the product.

5. Attachments

Do not use attachments not recommended by the manufacturer of this product as they may cause hazards.

6. Cleaning

Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

7. Heat

The product should be situated away from heat sources such as radiators, heat registers, stoves, or other products (including amplifiers) that produce heat.

SERVICING

1. Servicing

If your product is not operating correctly or exhibits a marked change in performance and you are unable to restore normal operation by following the detailed procedure in its operating instructions, do not attempt to service it yourself as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

2. Damage Requiring Service

Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

a. When the power supply cord or plug is damaged.
b. If liquid has been spilled, or objects have fallen into the product.
c. If the product has been exposed to rain or water.
d. If the product does not operate normally by following the operating instructions. Adjust only those controls that are covered by the operating instructions as an improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to its normal operation.
e. If the product has been dropped or damaged in any way.
f. When the product exhibits a distinct change in performance—this indicates a need for service.

3. Replacement Parts

When replacement parts are required, be sure the service technician has used replacement parts specified by the manufacturer or have the same characteristics as the original part. Unauthorized substitutions may result in fire, electric shock or other hazards.

4. Safety Check

Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in safe operating condition.

HOW TO USE THIS INSTRUCTION MANUAL

- All major sections and subsections are listed in the Table Of Contents on page 5. Use this when searching for information on a specific procedure or feature.
- The Index on pages 49–52 lists frequently-used terms, and the number of the page on which they are used or explained in the manual. This section also illustrates the controls and connections on the front and rear panel, the front display panel and the remote control.
- The ☞ mark signals a reference to another page for instructions or related information.
- Operation buttons necessary for the various procedures are clearly indicated through the use of illustrations at the beginning of each major section.

BEFORE YOU INSTALL YOUR NEW VCR . . .

. . . please read the sections/literature listed below.

- "Cautions" on page 2
- "Important Products Safety Instructions" on the previous pages

CONTENTS

INSTALLING YOUR NEW VCR 6

Basic Connections 6

INITIAL SETTINGS 8

Plug & Play 8
Language 10
Clock 11
  Preparation 11
  Semi-Auto 12
  Manual 13
Tuner 14
  Set Receivable Channels 14
  Add Or Delete A Channel 15

SIMPLE PLAYBACK AND RECORDING 16

Simple Playback 16
Simple Recording 17

PLAYBACK AND RECORDING FEATURES 18

Playback Features 18
  Still Picture/Frame-By-Frame Playback 18
  Slow Motion/Reverse Slow Motion 18
  Variable-Speed Search/Reverse Motion Playback 18
  High-Speed Search 19
  Skip Search 19
  Index Search 19
  Instant ReView 19
  Manual Tracking 19
  Picture Control 20
  Video Stabilizer 21
  Repeat Playback 22
  Counter Reset 22
  Tape Position Indicator 22
  Next-Function Memory 22
  Superimpose 23
  Select The Soundtrack (HR-VP673U Only) 24
  Movie Advance (HR-VP673U Only) 25
Active Video Calibration 26
  Preparation 26
  Recording 27
  Playback 27
Recording Features 28
  Record One Program While Watching Another 28
  Display Elapsed Recording Time 28
  Stereo And SAP (Second Audio Program) (HR-VP673U Only) 29
  To Record SAP Programs (HR-VP673U Only) 29

TIMER RECORDING 30

VCR Plus+ Timer Programming 30
VCR Plus+ Setup 32
Express Timer Programming 34
  Check, Cancel And Revise Programs 36
  Auto SP→EP Timer 37
  Auto Timer 37
Instant Timer Recording (ITR) 38

EDITING 39

Edit To Another VCR 39
Edit From A Camcorder Or Another VCR 40

SPECIAL FEATURES 42

  TV Multi-Brand Remote Control 42
  Cable Box Multi-Brand Remote Control 43
  DBS Receiver Multi-Brand Remote Control 44
  Control Two JVC VCRs 45
  Child Lock 45

TROUBLESHOOTING 46

Power 46
Tape Transport 46
Playback 46
Recording 46
Timer Recording 47
Other Problems 47

QUESTIONS AND ANSWERS 48

Playback 48
Recording 48
Timer Recording 48

INDEX 49

List Of Terms 49
Front View 50
Rear View 51
Front Display Panel 51
Remote Control 52

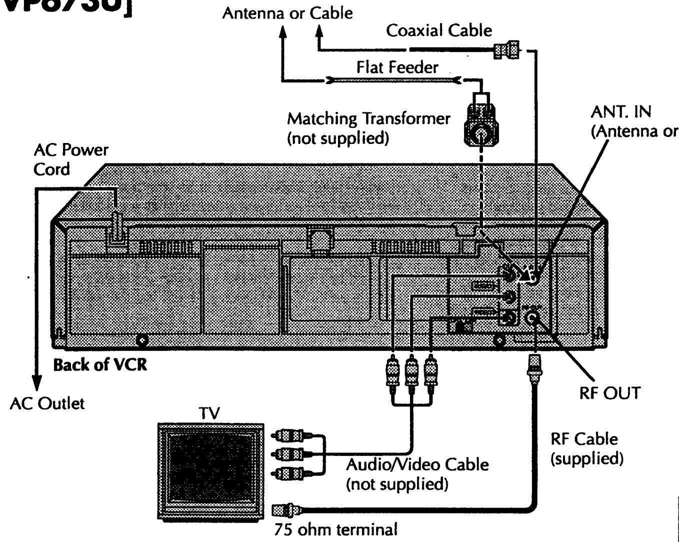
SPECIFICATIONS 53

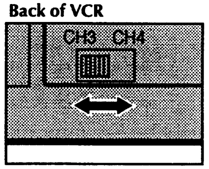
FOR SERVICING (Only in U.S.A.) 54

WARRANTY (Only in U.S.A.) 55

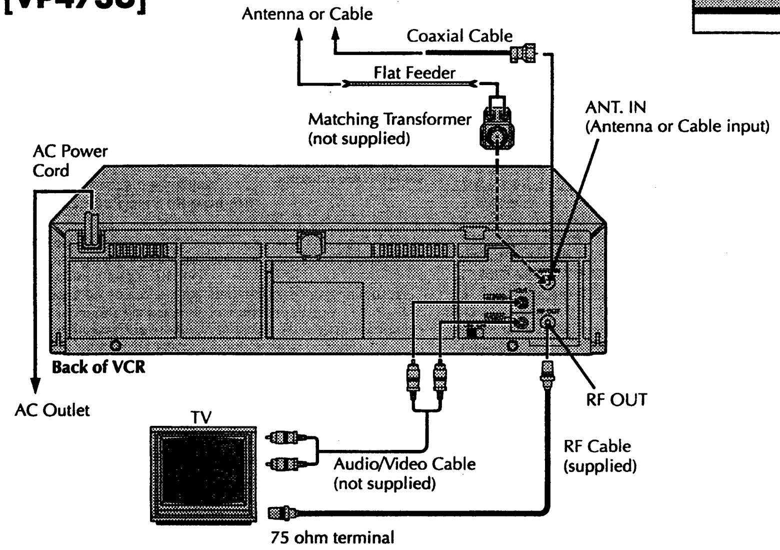
Basic Connections

[VP673U]


Antenna or Cable
Coaxial Cable
Flat Feeder
Matching Transformer
(not supplied)
ANT. IN
(Antenna or Cable input)
AC Power
Cord
Back of VCR
AC Outlet
RF OUT
TV
RF Cable
(supplied)
Audio/Video Cable
(not supplied)
75 ohm terminal


Back of VCR
CH3 CH4

[VP473U]


Antenna or Cable
Coaxial Cable
Flat Feeder
Matching Transformer
(not supplied)
ANT. IN
(Antenna or Cable input)
AC Power
Cord
Back of VCR
AC Outlet
RF OUT
TV
RF Cable
(supplied)
Audio/Video Cable
(not supplied)
75 ohm terminal

1

CHECK CONTENTS

Make sure the package contains all of the accessories listed in "SPECIFICATIONS" (☞ pg. 53).

2

SITUATE VCR

Place the VCR on a stable, horizontal surface.

3

CONNECT VCR TO TV

The connection method you use depends on the type of TV you have.

RF Connection

- *To Connect To A TV With NO AV Input Terminals . . .*
  - a– Disconnect the TV antenna from the TV.
  - b– Connect the TV antenna cable to the ANT. IN jack on the rear of the VCR.
  - c– Connect the supplied RF cable between the RF OUT jack on the rear of the VCR and the TV's antenna terminal. Set TV on CH3 or CH4 corresponding to the CH3 – CH4 switch setting on the back of the VCR.

AV Connection

- *To Connect To A TV With AV Input Terminals . . .*
  - a– Connect the antenna, VCR and TV as shown in the illustration.
  - b– Connect an Audio/Video Cable between the AUDIO OUT and VIDEO OUT jacks on the rear of the VCR and the AV IN jacks on the TV. Set your TV in video input mode or A/V input mode. Refer to the TV Instruction Manual.

For HR-VP473U Owners:
If your TV has AUDIO IN L and R connectors, connect the VCR to the L connector.

4

CONNECT VCR TO POWER SOURCE

Connect the power plug to an AC outlet.

- The clock and tuner channels will automatically be set when the antenna is connected and when the AC is first connected to the VCR (☞ pg. 8).
  (If "Auto" or "CH" is displayed on the front display panel before the VCR is powered on, the clock and tuner channels are being set automatically. Wait for the time to be displayed on the front display panel before powering on the VCR.)

5

FINAL PREPARATION FOR USE

Power on the VCR and select the VCR channel (3 or 4) by setting the switch on the rear of the VCR as shown in the illustration.
You can now perform simple playback (☞ pg. 16) or simple recording (☞ pg. 17).

NOTES:

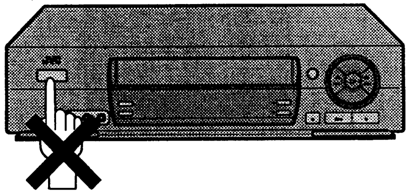
- *The VCR channel is the channel on the TV which will display the audio and video signals from the VCR. The VCR's CH3-CH4 switch, on the back of the VCR, sets the VCR channel to CH3 or CH4.*
- *The CH3–CH4 switch is preset to the CH3 position. Set to CH4 if CH3 is used for broadcasting in your area and set the channel on the TV to correspond to the VCR's CH3–CH4 switch setting.*
- *If RF connection to TV is used, when switching from VCR to TV mode and from TV to VCR it may be necessary to issue a CH UP and then CH DOWN on TV to obtain a good quality picture.*
- *Even if you are using AV cables to connect your VCR to your TV, you must also connect it using the RF cable. This will ensure that you can record one show while watching another (☞ pg. 28).*
- *For full identification of the VCR's rear panel, refer to the Index (REAR VIEW ☞ pg. 51).*

Plug & Play

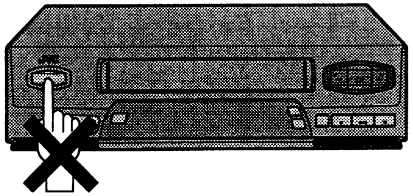
Auto Clock Set/Auto Tuner Set

ATTENTION
If you use a cable box, Plug & Play will not function; set the clock and tuner channels manually. (☞ pg.11 – 15)

[VP673U]



[VP473U]



IMPORTANT

- Don't press any buttons on the VCR or remote while Plug & Play is in progress.
- If you perform Plug & Play successfully, there's no need to perform the Clock (☞ pg. 11) and Tuner (☞ pg. 14) procedures. If, however, you want to add or delete channels, refer to "Add Or Delete A Channel" on page 15.

The Plug & Play function sets the clock and tuner channels automatically when power is first connected to the VCR. The antenna cable must be connected for the Plug & Play function.

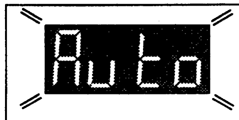
The time and date can be set automatically from clock setting data that is transmitted by one of the regular TV broadcast channels. We call this TV channel the "Host Channel" and it is a PBS channel in your area.

PLUG & PLAY SETUP

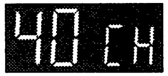
1 **Connect the antenna cable to the VCR (☞ pg. 6). Then connect the VCR's power plug to an AC outlet. Do not power on the VCR. The clock and tuner channels will be set automatically.**

NOTES:

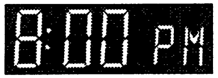
- Auto clock set is performed first. The auto clock set function scans all the channels received by your VCR to find the Host Channel and then sets the clock. "Auto" blinks on the front display panel during Auto clock set.
- Auto channel set is performed next. The auto channel set function scans all the channels that are receivable by your VCR. It then automatically assigns each receivable channels to the **CH▲▼** (+/–) buttons. It skips non-receivable channels. During auto channel set the channel numbers are displayed as they are scanned and set.
- When Plug & Play has been completed successfully the correct time is displayed.
- If an incorrect time or "– –:– –" appears on the display panel, see "What To Do If Plug & Play Has Failed" on next page.



During Initial Auto Clock Set
"Auto" blinks.



During Auto Channel Set
The channel numbers are displayed as they are scanned and set.



Plug & Play Completed
The current time (including AM/PM) is displayed.

* If an incorrect time or "– –:– –" appears on the display panel, see "What To Do If Plug & Play Has Failed" on next page.

INFORMATION

- If "AUTO CLOCK" is set to "ON" at the Clock Set screen on page 12, the clock will be adjusted automatically by the host channel every hour on the hour (except for 11:00 PM, midnight, 1:00 AM and 2:00 AM) by the incoming PBS channel clock setting data. (This automatic clock adjustment can only be performed when the VCR's power is turned off. The clock will be adjusted on the hour based on the time displayed on the VCR, not on the actual real time.) The default setting of "AUTO CLOCK" is "ON".
- If the memory backup fails, because of a power outage or because the AC was removed from the VCR, Plug & Play will be performed when power is restored to the VCR.

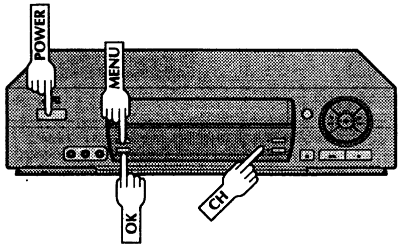
What To Do If Plug & Play Has Failed

- If an incorrect time is displayed on the front display panel, you may be receiving the clock setting data of a PBS channel from an adjacent time zone, or an incorrect PBS channel from a cable TV system. In this case, perform the Semi-Auto (☞ pg. 12) or Manual Clock Set (☞ pg. 13) procedure. Auto channel set has already taken place and it need not be set again.
- If "- -:- -" appears on the display, your antenna cable may not be connected to the VCR or there may not be a Host PBS signal available in your area. Ensure that the antenna cable is connected correctly. Then power on and power off the VCR; the Plug & Play function will be automatically reactivated and "Auto" will be displayed on the VCR's front panel. If Plug & Play is not performed but the antenna cable is connected correctly, perform the Manual Clock Set procedure (☞ pg. 13). Auto channel set has not yet taken place, so please also perform the "Set Receivable Channels" procedure (☞ pg. 14).

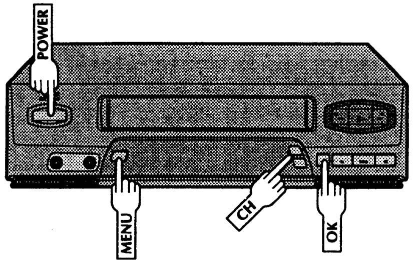
Language

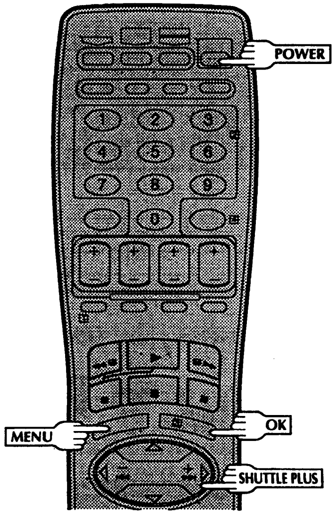
Turn on the TV and select the VCR channel 3 or 4 (or AV mode).

[VP673U]


POWER
MENU
CH
OK

[VP473U]


POWER
MENU
CH
OK


POWER
MENU
OK
SHUTTLE PLUS

This VCR offers you the choice to view on-screen messages in English, Spanish or French (not including messages superimposed on the TV picture). Select the desired language using this procedure. The default setting is "ENGLISH".

1

TURN ON THE VCR

Press **POWER**.

2

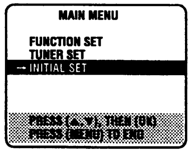
ACCESS MAIN MENU SCREEN

Press **MENU**.

3

ACCESS INITIAL SET SCREEN

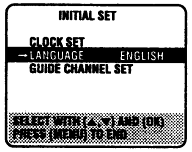
At the Main Menu screen, move the highlight bar (arrow) to "INITIAL SET" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷.


MAIN MENU
FUNCTION SET
TUNER SET
→ INITIAL SET
PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END

4

SELECT LANGUAGE

Move the highlight bar (arrow) to "LANGUAGE" by pressing **CH ▲▼** or **SHUTTLE PLUS** △▽, then press **OK** or **SHUTTLE PLUS** ▷ to select the desired language.


INITIAL SET
CLOCK SET
→ LANGUAGE ENGLISH
GUIDE CHANNEL SET
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

5

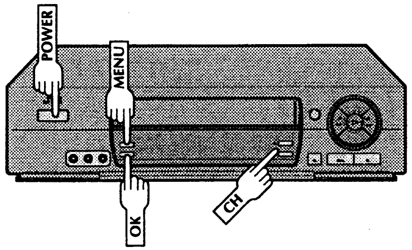
RETURN TO NORMAL SCREEN

Press **MENU**.

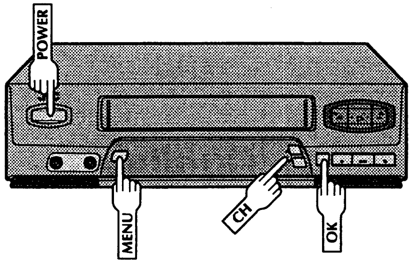
Clock

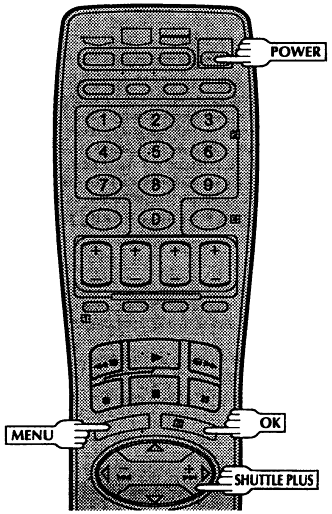
Turn on the TV and select the VCR channel 3 or 4 (or AV mode).

[VP673U]


POWER
MENU
CH
OK

[VP473U]


POWER
MENU
CH
OK


POWER
MENU
OK
SHUTTLE PLUS

Perform clock setting only if the clock has not been set correctly by the Plug & Play function or you use a cable box. Access the Clock Set screen to perform the Semi-Auto or Manual clock setting procedure. Each procedure starts from step 5.
If you use a cable box, set the clock manually. (☞ pg. 13)

Preparation

1

TURN ON THE VCR

Press **POWER**.

2

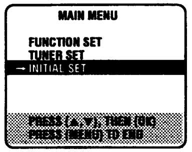
ACCESS MAIN MENU SCREEN

Press **MENU**.

3

ACCESS INITIAL SET SCREEN

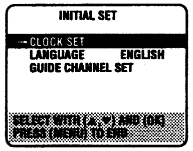
At the Main Menu screen, move the highlight bar (arrow) to "INITIAL SET" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷.


MAIN MENU
FUNCTION SET
TUNER SET
→ INITIAL SET
PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END

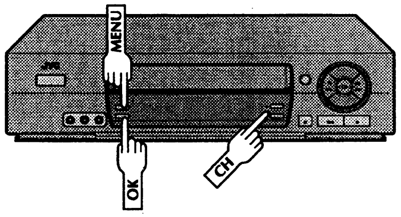
4

ACCESS CLOCK SET SCREEN

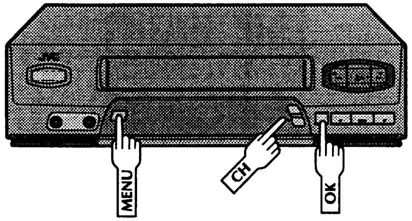
Move the highlight bar (arrow) at the Initial Set screen to "CLOCK SET" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷.

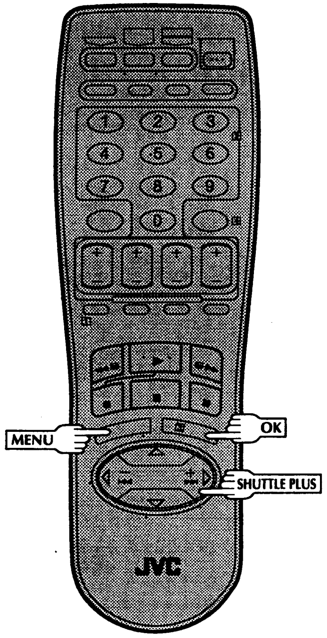

INITIAL SET
→ CLOCK SET
LANGUAGE ENGLISH
GUIDE CHANNEL SET
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

[VP673U]



[VP473U]





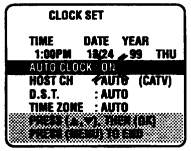
Semi-Auto

You can change the Host Channel/D.S.T. /Time Zone setting manually.

5 SET AUTO CLOCK TO ON

At the Clock Set screen, press **OK** or **SHUTTLE PLUS** ▷ to move the highlight bar to "AUTO CLOCK" and press **CH** ▲▼ or **SHUTTLE PLUS** △▽ to set to "ON".

a– To select the Host Channel — go to step **6**
b– To select the D.S.T. mode — go to step **7**
c– To select the Time Zone — go to step **8**



```
        CLOCK SET

TIME       DATE   YEAR
 1:00PM    12/24  99   THU
AUTO CLOCK  ON
HOST CH     AUTO  (CATV)
D.S.T.     : AUTO
TIME ZONE  : AUTO
PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END
```

NOTE:

The time that has been set previously will be erased when "AUTO CLOCK", "HOST CH", "D.S.T." or "TIME ZONE" setting is changed.

6 SELECT HOST CHANNEL

You can either select "AUTO" or enter a PBS channel number. Move the highlight bar to "HOST CH" by pressing **OK** or **SHUTTLE PLUS** ▷, then press **CH** ▲▼ or **SHUTTLE PLUS** △▽ to set to "AUTO" or the desired PBS channel number.

NOTE:

There are some PBS channels that do not transmit clock setting data.

7 SELECT D.S.T. MODE

You have three choices:
a– Select "AUTO" and the adjustment to your VCR's clock will be made according to the incoming signal from the host channel.
b– Select "ON" and the adjustment will be made based on the clock itself.
c– Select "OFF" if Daylight Saving Time does not apply to you.

Move the highlight bar to "D.S.T." by pressing **OK** or **SHUTTLE PLUS** ▷, then press **CH** ▲▼ or **SHUTTLE PLUS** △▽ to select the desired mode.

****AUTO DAYLIGHT SAVING TIME**

This function enables automatic adjustment of the VCR's clock at the start and end of Daylight Saving Time.
With Auto DST activated, . . .
. . . on the first Sunday of April at 2:00 AM, the clock is adjusted to 3:00 AM.
. . . on the last Sunday of October at 2:00 AM, the clock is adjusted to 1:00 AM.

8 SELECT TIME ZONE

You can select the time zone automatically or manually. Move the highlight bar to "TIME ZONE" by pressing **OK** or **SHUTTLE PLUS** ▷, then press **CH** ▲▼ or **SHUTTLE PLUS** △▽ to select "AUTO" or the desired time zone.

AUTO ATLANTIC
HAWAII EASTERN
ALASKA CENTRAL
PACIFIC MOUNTAIN

NOTE:

*If an incorrect time is displayed by the Plug & Play function, you may be receiving the clock setting data of a PBS channel from an adjacent time zone or from an incorrect PBS channel from a cable TV system. If you selected "AUTO" for the host channel in step **6**, be sure to select the correct time zone manually.*

9 RETURN TO NORMAL SCREEN

Press **MENU**.

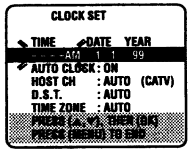
IMPORTANT

Turn the VCR off after performing the Semi-Auto Clock Set procedure. "Auto" will appear on the front display panel when the clock is being set. The current time will appear automatically when the clock is set.

Manual

5 SET TIME

Press **CH** ▲▼ or **SHUTTLE PLUS** △▽ until the desired time appears, then press **OK** or **SHUTTLE PLUS** ▷ .



```
        CLOCK SET

TIME      DATE   YEAR
- - - - -AM  1  1   99
AUTO CLOCK : ON
HOST CH    : AUTO  (CATV)
D.S.T.     : AUTO
TIME ZONE  : AUTO
PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END
```

- Press and hold **CH** ▲▼ or **SHUTTLE PLUS** △▽ to change the time by 30 minutes.
- When the time is entered manually, "AUTO CLOCK" will be automatically set to "OFF", and "HOST CH" and "TIME ZONE" will disappear.

6 SET DATE

Press **CH** ▲▼ or **SHUTTLE PLUS** △▽ until the desired date appears, then press **OK** or **SHUTTLE PLUS** ▷.

- Press and hold **CH** ▲▼ or **SHUTTLE PLUS** △▽ to change the date by 15 days.

7 SET YEAR

Press **CH** ▲▼ or **SHUTTLE PLUS** △▽ until the desired year appears, then press **OK** or **SHUTTLE PLUS** ▷ twice.

8 SELECT D.S.T. MODE

Press **CH** ▲▼ or **SHUTTLE PLUS** △▽ to select the desired mode.
a– Set to "ON" so that the adjustment to your VCR's clock will be made on the clock itself.
b– Set to "OFF" if Daylight Saving Time does not apply to you.

9 START CLOCK

Press **MENU** and normal screen appears.

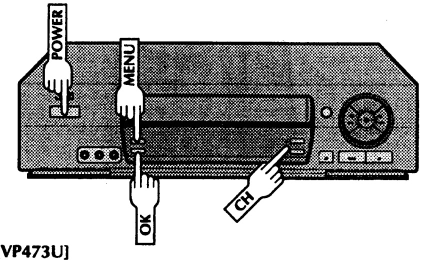
To Make Corrections

Press **OK** or **SHUTTLE PLUS** ▷ until the item you want to change blinks, then press **CH** ▲▼ or **SHUTTLE PLUS** △▽.

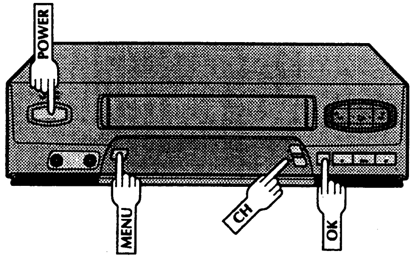
Tuner

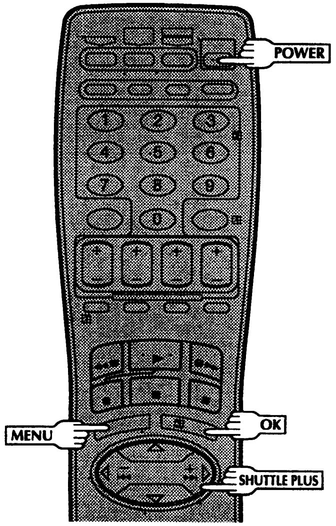
Turn on the TV and select the VCR channel 3 or 4 (or AV mode).

[VP673U]



[VP473U]





Set Receivable Channels

1

TURN ON THE VCR

Press **POWER**.

2

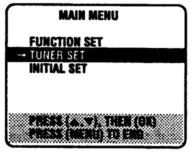
ACCESS MAIN MENU SCREEN

Press **MENU**.

3

ACCESS TUNER SET SCREEN

Move the highlight bar (arrow) to "TUNER SET" by pressing **CH▲▼** or **SHUTTLE PLUS△▽**, then press **OK** or **SHUTTLE PLUS ▷**.


MAIN MENU

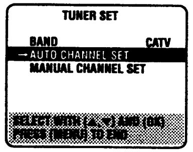
FUNCTION SET
→ TUNER SET
INITIAL SET

PRESS [▲,▼], THEN [OK]
PRESS [MENU] TO END

4

PERFORM AUTO CHANNEL SET

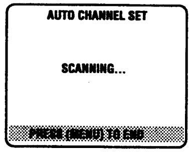
Move the highlight bar (arrow) to "AUTO CHANNEL SET" by pressing **CH▲▼** or **SHUTTLE PLUS△▽**, then press **OK** or **SHUTTLE PLUS ▷**.


TUNER SET

BAND CATV
→ AUTO CHANNEL SET
MANUAL CHANNEL SET

SELECT WITH [▲,▼] AND [OK]
PRESS [MENU] TO END

- Receivable channels in your area are automatically assigned to the **CH▲▼** (+/–) buttons, and non-receivable channels are skipped.


AUTO CHANNEL SET

SCANNING...

PRESS [MENU] TO END

NOTES:

- *At the end of Auto Channel Set, "SCAN COMPLETED" appears on screen.*
- *If the scan was unsuccessful, "SCAN COMPLETED -NO SIGNAL-" appears on screen. Check the connections and start again.*

5

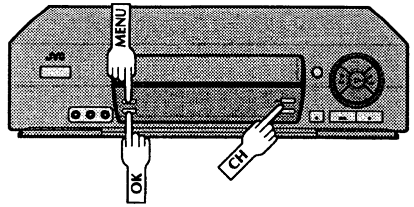
RETURN TO NORMAL SCREEN

Press **MENU**.

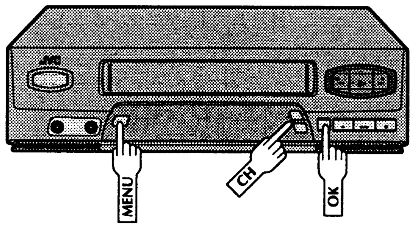
INFORMATION

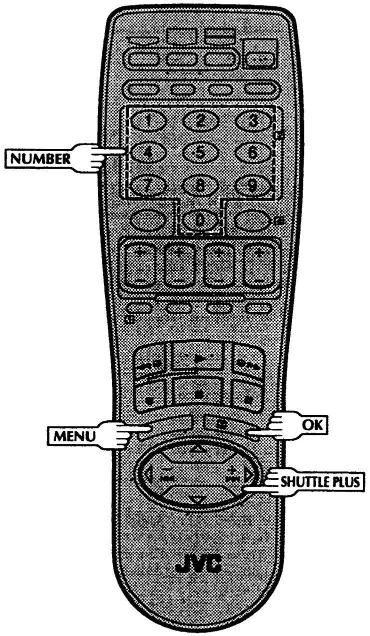
The VCR detects the band (TV or CATV) and selects the correct band automatically during Auto Channel Set. The selected band will be displayed on the right side of "BAND" on the Tuner Set screen.

[VP673U]



[VP473U]





Add Or Delete A Channel

1

ACCESS MAIN MENU SCREEN

Press **MENU**.

2

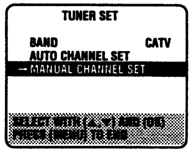
ACCESS TUNER SET SCREEN

Move the highlight bar (arrow) to "TUNER SET" by pressing **CH▲▼** or **SHUTTLE PLUS△▽**, then press **OK** or **SHUTTLE PLUS ▷**.

3

ACCESS MANUAL CHANNEL SET SCREEN

Move the highlight bar (arrow) to "MANUAL CHANNEL SET" by pressing **CH▲▼** or **SHUTTLE PLUS△▽**, then press **OK** or **SHUTTLE PLUS ▷**.


TUNER SET

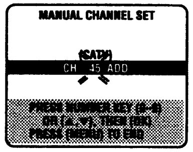
BAND CATV
AUTO CHANNEL SET
→ MANUAL CHANNEL SET

SELECT WITH [▲,▼] AND [OK]
PRESS [MENU] TO END

4

ADD OR SKIP DESIRED CHANNEL

Input the channel number using the **NUMBER** keys or by pressing **CH▲▼** or **SHUTTLE PLUS△▽**, then press **OK** or **SHUTTLE PLUS ▷** to set to "ADD" or "SKIP" as required. Repeat for each channel you want to add or skip.


MANUAL CHANNEL SET

(CATV)
CH 45 ADD

PRESS NUMBER KEY (0-9)
OR [▲,▼], THEN [OK]
PRESS [MENU] TO END

5

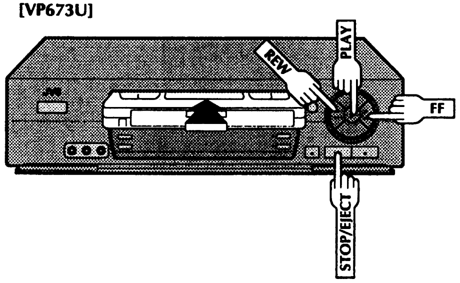
RETURN TO NORMAL SCREEN

Press **MENU**.

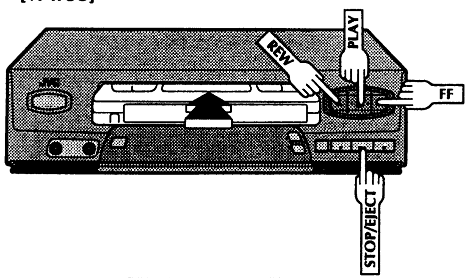
Simple Playback

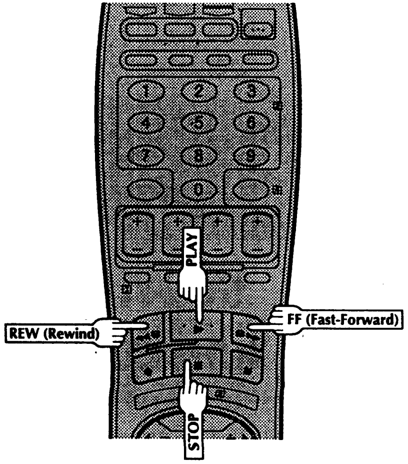
Turn on the TV and select the VCR channel 3 or 4 (or AV mode).

[VP673U]



[VP473U]





1 LOAD A CASSETTE

Make sure the window side is up, the rear label side is facing you and the arrow on the front of the cassette is pointing towards the VCR. Don't apply too much pressure when inserting.

- The VCR's power comes on automatically.
- The counter is automatically reset to "0:00:00".
- If the cassette's record safety tab has been removed, playback begins automatically.

2 FIND PROGRAM START POINT

If the tape is advanced past the start point, press **REW**. To go forward, press **FF.**

3 START PLAYBACK

Press **PLAY**. "VIDEO CALIBRATION" appears on the screen (when VIDEO CALIBRATION is set to "ON" ☞ pg. 26).

4 STOP PLAYBACK

Press **STOP** or **STOP/EJECT**. Then press **STOP/EJECT** to remove the cassette.

INFORMATION

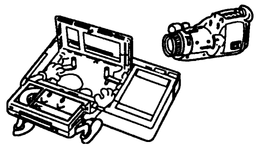
This video recorder is equipped with SQPB (S-VHS QUASI PLAYBACK) that lets you watch tapes recorded in the S-VHS format with regular VHS resolution.

- SQPB does not deliver Super VHS resolution.
- S-VHS recording is not possible with this video recorder.

Usable cassettes

Full-Size VHS
T-30 (ST-30**)
T-60 (ST-60**)
T-90
T-120 (ST-120**)
T-160 (ST-160**)
ST-210**

Compact VHS*
TC-20 (ST-C20**)
TC-30 (ST-C30**)
TC-40 (ST-C40**)



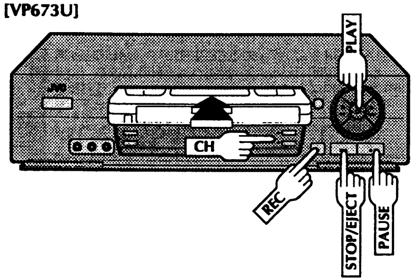
* Compact VHS camcorder recordings can be played on this video recorder. Simply place the recorded cassette into a VHS Cassette Adapter and it can be used just like any full-sized VHS cassette.

** This video recorder can record on regular VHS and Super VHS cassettes. However, it will record regular VHS signals only.

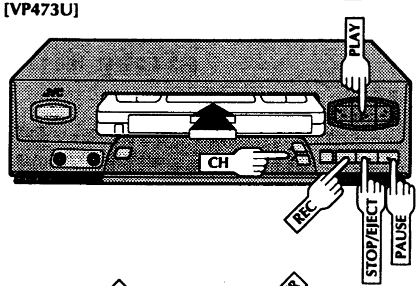
Simple Recording

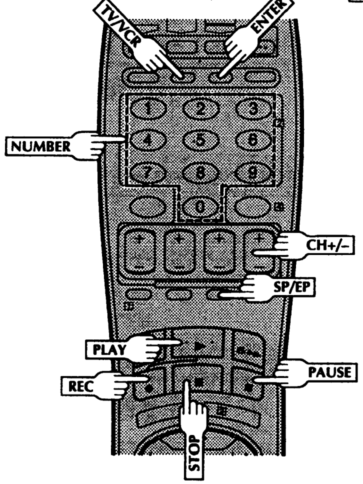
Turn on the TV and select the VCR channel 3 or 4 (or AV mode).

[VP673U]



[VP473U]





1 LOAD A CASSETTE

Make sure the record safety tab is intact. If not, cover the hole with adhesive tape before inserting the cassette.

2 SELECT RECORDING CHANNEL

Press **CH▲▼** (+/–). Or press the appropriate **NUMBER** keys, then press **ENTER**. (The channel changes after a few seconds whether you press **ENTER** or not.)

- If you use the RF connection, by pressing the **TV/VCR** button, select VCR mode to view the program to be recorded.

3 SET TAPE SPEED

Press **SP/EP** to set the recording speed.

4 START RECORDING

Press and hold **REC** and press **PLAY** on the remote control, or press **REC** on the VCR's front panel.

Video Calibration takes places at the beginning of both the first SP and the first EP recording after inserting the cassette (when video calibration is set to "ON" ☞ pg. 26).

5 PAUSE/RESUME RECORDING

Press **PAUSE**. Press **PLAY** to resume recording.

- During record pause, you can change the recording channel by using the **CH▲▼** (+/–) buttons or **NUMBER** keys.

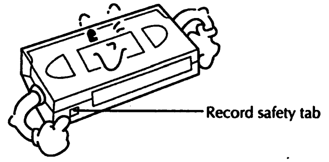
Video Calibration will not take place if the tape speed is changed while in record pause mode.

6 STOP RECORDING

Press **STOP** or **STOP/EJECT**. Then press **STOP/EJECT** to remove the cassette.

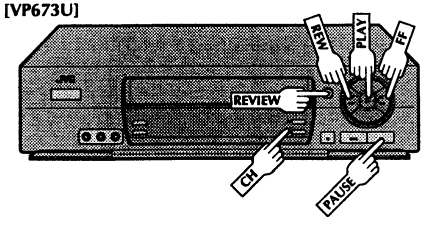
Accidental erasure prevention

- To prevent accidental recording on a recorded cassette, remove its record safety tab.
  To record on it later, cover the hole with adhesive tape.

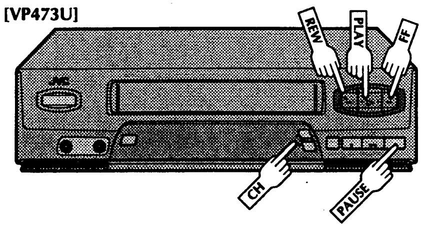


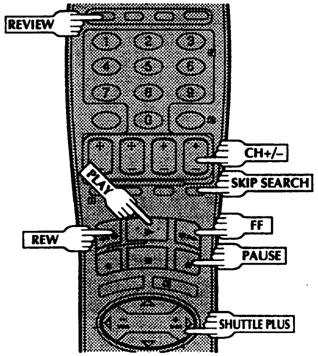
Playback Features

[VP673U]

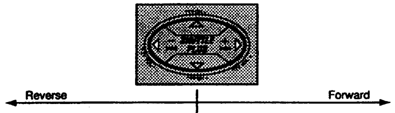


[VP473U]





NOTE: Refer to the following for the operations described on this page.



Reverse search 3 steps	Reverse play	Reverse slow motion 2 steps	Slow motion 2 steps	Play	Forward search 4 steps

Still Picture/Frame-By-Frame Playback

1

PAUSE DURING PLAYBACK

Press **PAUSE**. If there is vertical jitter, use the **CH ▲** (+) or ▼ (–) button to correct the picture.

2

ACTIVATE FRAME-BY-FRAME PLAYBACK

Press **PAUSE** repeatedly to advance one frame at a time.

OR

Press **SHUTTLE PLUS ►►I** repeatedly for forward frame-by-frame playback or **SHUTTLE PLUS I◄◄** repeatedly for reverse frame-by-frame playback.

To resume normal playback, press **PLAY**.

Slow Motion/Reverse Slow Motion

1

ACTIVATE SLOW-MOTION PLAYBACK

For hands-free slow-motion, press and release **SHUTTLE PLUS I◄◄** during playback to decrease speed in the forward direction. Continue to press and release **SHUTTLE PLUS I◄◄** to select the reverse slow motion, reverse play and reverse search modes.

OR

During still picture, press and hold **SHUTTLE PLUS ►►I** for forward slow motion, or press and hold **SHUTTLE PLUS I◄◄** for reverse slow motion. Release to return to still picture.

OR

For forward slow motion during still picture, press and hold **PAUSE** for more than 2 seconds. Press **PAUSE** again to return to still picture.

To resume normal playback, press **PLAY**.

Variable-Speed Search/Reverse Motion Playback

1

ACTIVATE VARIABLE-SPEED SEARCH

During playback, repeatedly press and release **SHUTTLE PLUS I◄◄** or **►►I** to select the search speed.

- To increase the speed in the forward direction, press and release **►►I** repeatedly to select the various forward search modes.
- To decrease the speed in the forward direction, press and release **I◄◄**.
- To play in reverse slow motion, and in reverse play mode, continue to press **I◄◄** repeatedly after selecting all the forward slow motion modes.

To resume normal playback, press **PLAY**.

High-Speed Search

1

ACTIVATE HIGH-SPEED SEARCH

During playback or still, press **FF** for forward high-speed search, or **REW** for reverse high-speed search.

To resume normal playback, press **PLAY**.

NOTE:

*For short searches, during playback or still, press and hold **FF** or **REW**. When released, normal playback resumes.*

Skip Search

1

SKIP OVER UNWANTED SECTIONS

Press **SKIP SEARCH** 1 to 4 times during playback. Each press initiates a 30-second period of fast-motion playback. Normal playback resumes automatically.

NOTES:

- *To return to normal playback during a Skip Search, press **PLAY**.*
- *If the Skip Menu screen appears, see page 25.*

Index Search

Index codes are placed on the tape at the start of each recording. You can find and automatically play back from the start of any recording using the Index Search function.

1

START SEARCH

While the tape is stopped, press **SHUTTLE PLUS I◄◄** or **►►I** (◁or ▷).

2

ACCESS DISTANT CODE

To access a recording 2–9 index codes away, press **SHUTTLE PLUS I◄◄** or **►►I** (◁or ▷) repeatedly until the correct number is displayed on screen (only if SUPERIMPOSE is set to ON (☞ pg. 23). Playback begins automatically when the desired recording is located.

- If necessary press **REW** or **FF** when play starts to search visually to find the very beginning of the desired program.

NOTE:

An index code is not placed on the tape when recording is paused and then resumed.

Instant ReView

At the press of a button, you can power up your VCR, rewind the tape and begin viewing the most recent timer-recorded program.

1

ACTIVATE INSTANT REVIEW

After ensuring that the Timer mode is disengaged, press **REVIEW**.

- The power comes on and the VCR rewinds to the index code indicating the start of the last timer-recorded program, then begins playback automatically.
- You can access a program 2–9 index codes away from the current position on the tape. If, for example, you have 5 programs recorded and you want to watch the third one, press **REVIEW** three times.
- If necessary press **REW** or **FF** when play starts to search visually to find the very beginning of the desired program.
- If the tape is already rewound when **REVIEW** is pressed, it will play the tape from the beginning. It will not fast forward to an index code.
- The Instant Review function will also operate if the VCR's power is on.

Manual Tracking

Once playback begins, the VCR's automatic tracking function is engaged. If tracking noise appears in the picture, you can override this and make the adjustment manually.

1

ENGAGE MANUAL TRACKING MODE

During playback, press the **CH▲** and **▼** buttons on the VCR's front panel simultaneously to cancel the automatic tracking mode and enable manual tracking adjust.

2

ADJUST MANUAL TRACKING

Press **CH ▲** (+) or **▼** (–) on the VCR's front panel or remote. Press briefly for fine adjust, or press and hold for coarse adjust. Watch the screen and continue adjusting until optimum picture and sound quality are achieved.

3

RE-ENGAGE AUTOMATIC TRACKING

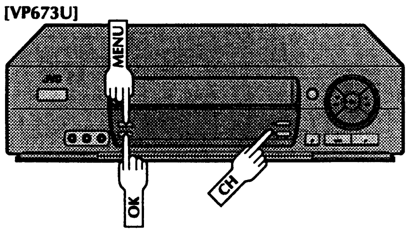
Press the **CH▲** and **▼** buttons on the VCR's front panel simultaneously.

- When automatic tracking is re-engaged, Video Calibration is automatically activated.

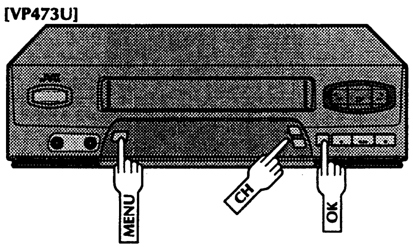
NOTES:

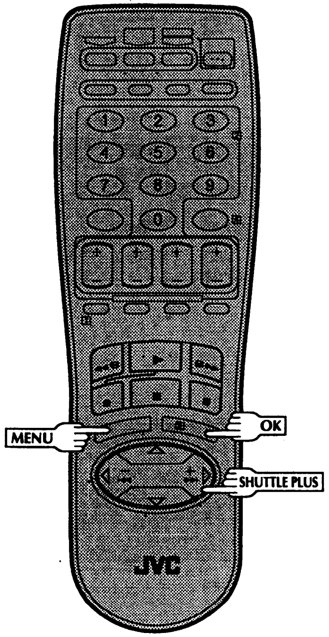
- *To obtain a noiseless still picture it may be necessary to adjust tracking in slow playback and then engage Pause.*
- *Manual tracking is possible during hands-free slow-motion. During hands-free slow-motion playback, simply press **CH ▲** (+) or **▼** (–) on the VCR's front panel or remote to adjust tracking.*

[VP673U]



[VP473U]





Picture Control

This feature helps you to adjust the playback picture quality according to your preference. *The default setting is "AUTO."

1 ACCESS MAIN MENU SCREEN

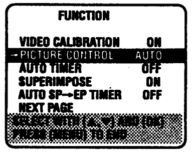
Press **MENU**.

2 ACCESS FUNCTION SET SCREEN

Move the highlight bar (arrow) to "FUNCTION SET" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷.

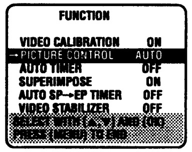
3 SELECT PICTURE CONTROL SET MODE

HR-VP673U



```
FUNCTION

VIDEO CALIBRATION      ON
→PICTURE CONTROL       AUTO
AUTO TIMER             OFF
SUPERIMPOSE            ON
AUTO SP→EP TIMER       OFF
NEXT PAGE
SELECT WITH [▲,▼] AND [OK]
PRESS [MENU] TO END
```

HR-VP473U



```
FUNCTION

VIDEO CALIBRATION      ON
→PICTURE CONTROL       AUTO
AUTO TIMER             OFF
SUPERIMPOSE            ON
AUTO SP→EP TIMER       OFF
VIDEO STABILIZER       OFF
SELECT WITH [▲,▼] AND [OK]
PRESS [MENU] TO END
```

Move the highlight bar (arrow) to "PICTURE CONTROL" by pressing **CH ▲▼** or **SHUTTLE PLUS** △▽, then press **OK** or **SHUTTLE PLUS** ▷ to select the desired mode.

AUTO*: Normally select AUTO.
It automatically adjust the picture quality.
* When VIDEO CALIBRATION is set to OFF (☞ pg. 26), you can only select NORM instead of AUTO.

EDIT: Select when you dub tapes.

SOFT: Select when you want to soften the picture.

SHARP: Select when you want to sharpen the picture.

NOTE:

- *When you select EDIT, SHARP or SOFT, the selected mode will not change until you select again.*
- *When you select EDIT to dub tapes, be sure to select AUTO (or NORM when VIDEO CALIBRATION is set to OFF) after you finish dubbing the tapes.*

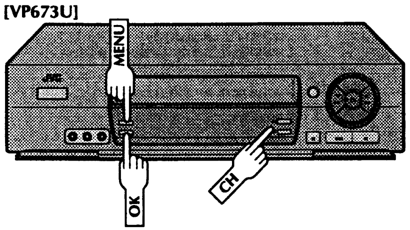
4 RETURN TO NORMAL SCREEN

Press **MENU**.

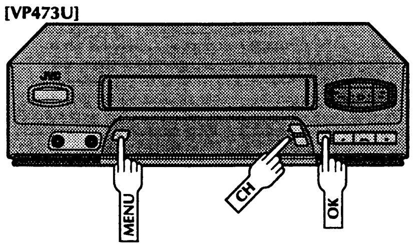
NOTE:

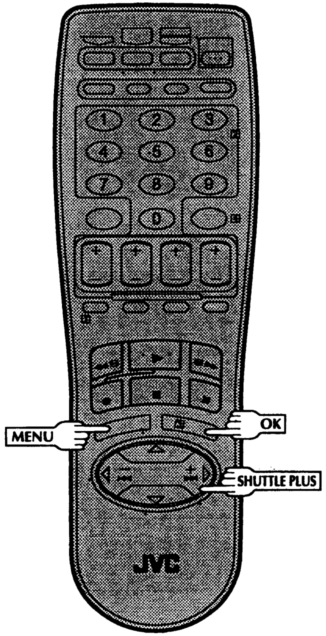
Select EDIT when you are dubbing tapes. Refer to page 39.

[VP673U]



[VP473U]





Video Stabilizer

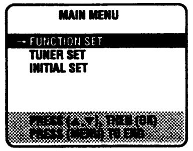
By activating the Video Stabilizer you can correct vertical vibrations in the picture when playing back unstable recordings that were made on another VCR. When this function is set to "ON", vertical vibration will be automatically corrected. *The default setting is "OFF".

1 ACCESS MAIN MENU SCREEN

Press **MENU**.

2 ACCESS FUNCTION SET SCREEN

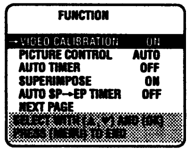
Move the highlight bar (arrow) to "FUNCTION SET" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS** ▷.



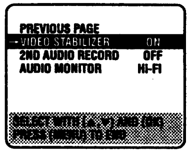
```
MAIN MENU

→FUNCTION SET
TUNER SET
INITIAL SET

PRESS [▲,▼], THEN [OK]
PRESS [MENU] TO END
```

3 ACTIVATE VIDEO STABILIZER

HR-VP673U

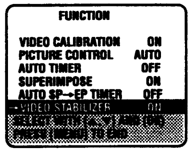


```
FUNCTION

→VIDEO CALIBRATION     ON
PICTURE CONTROL        AUTO
AUTO TIMER             OFF
SUPERIMPOSE            ON
AUTO SP→EP TIMER       OFF
NEXT PAGE
SELECT WITH [▲,▼] AND [OK]
PRESS [MENU] TO END
```



```
PREVIOUS PAGE
→VIDEO STABILIZER      ON
2ND AUDIO RECORD       OFF
AUDIO MONITOR          HI-FI

SELECT WITH [▲,▼] AND [OK]
PRESS [MENU] TO END
```

HR-VP473U



```
FUNCTION

VIDEO CALIBRATION      ON
PICTURE CONTROL        AUTO
AUTO TIMER             OFF
SUPERIMPOSE            ON
AUTO SP→EP TIMER       OFF
→VIDEO STABILIZER      ON
SELECT WITH [▲,▼] AND [OK]
PRESS [MENU] TO END
```

Move the highlight bar (arrow) to "VIDEO STABILIZER" by pressing **CH ▲▼** or **SHUTTLE PLUS** △▽, then press **OK** or **SHUTTLE PLUS** ▷ to set to "ON".

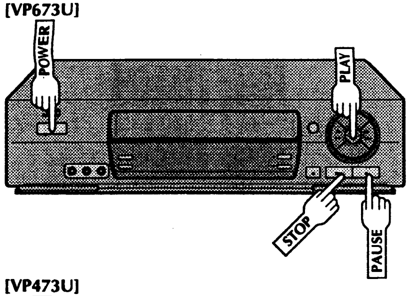
4 RETURN TO NORMAL SCREEN

Press **MENU**.

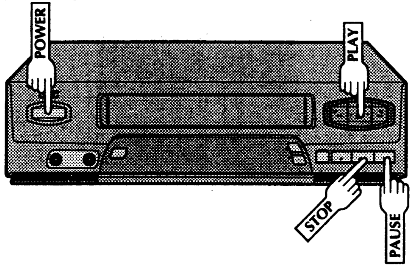
NOTES:

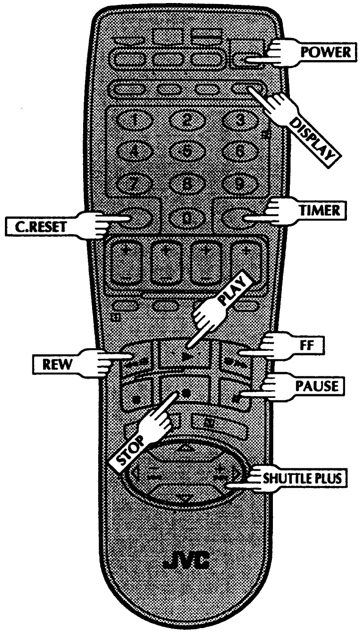
- *When you finish viewing the tape, be sure to set it back to "OFF".*
- *Regardless of the setting, this function has no effect during recording and during special-effects playback.*
- *The Superimpose mode indications may jitter vertically when "VIDEO STABILIZER" is set to "ON".*
- *To watch recordings with close-caption, it is necessary to set the Video Stabilizer function to "OFF".*

[VP673U]



[VP473U]

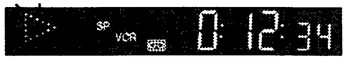




Repeat Playback

1 START REPEAT

Press and hold **PLAY** (until "▷" blinks on the front display panel) during playback, then release.



- The entire tape is played back 50 times.

2 STOP REPEAT

To stop, press **STOP** at any time.

NOTE:

*Pressing **PLAY, REW, FF, PAUSE** or **SHUTTLE PLUS** ⏮ or ⏭ also stops Repeat Playback.*

Counter Reset

1 RESET COUNTER TO ZERO

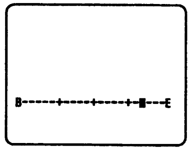
Press **C.RESET**.

NOTE:

*By pressing the **DISPLAY** button, you can change the display to show the counter reading, channel number or clock time. (Channel number is not displayed during playback.)*

Tape Position Indicator

The Tape position indicator appears on screen when, from the stop mode, you press **FF** or **REW**, or perform an Index Search or Instant ReView. The position of "▮" in relation to "B" (Beginning) or "E" (End) shows you where you are on the tape.



NOTES:

- *"SUPERIMPOSE" must be set to "ON", or the indicator will not appear (☞ pg. 23).*
- *It may take a few seconds for the Tape Position Indicator to be displayed.*

Next-Function Memory

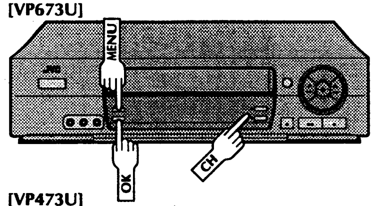
The Next Function Memory "tells" the VCR what to do after rewinding. Before continuing, ensure that the VCR is in stop mode.

a– For Automatic Start Of Playback After Tape Rewind . . .
. . . press **REW**, then press **PLAY** within 2 seconds.
b– For Automatic Power Off After Tape Rewind . . .
. . . press **REW**, then press **POWER** within 2 seconds.
c– For Automatic Timer Standby After Tape Rewind . . .
. . . press **REW**, then press **TIMER** within 2 seconds.

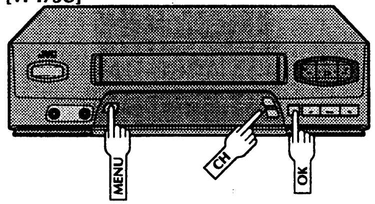
NOTE:

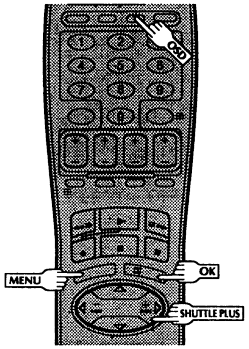
It is not possible to select the Automatic Timer functions if the cassette's record safety tab is removed.

[VP673U]



[VP473U]





To recall an indication

1. Press **OSD**.
   - ■ All indications corresponding to the current status are displayed for 5 seconds. After that, the counter information and RECORD/PAUSE if in the Record Pause mode, are left displayed on the screen.
2. Press **OSD** again to clear the display.
   - ■ The RECORD/PAUSE indication is left displayed on the screen.

Superimpose

This function, switchable between ON and OFF, determines whether or not operational indicators will appear on screen.

1 ACCESS MAIN MENU SCREEN

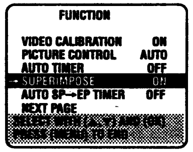
Press **MENU**.

2 ACCESS FUNCTION SET SCREEN

Move the highlight bar (arrow) to "FUNCTION SET" by pressing **CH▲▼** or **SHUTTLE PLUS△▽**, then press **OK** or **SHUTTLE PLUS ▷**.

3 SELECT SUPERIMPOSE SET MODE

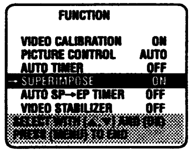
HR-VP673U



FUNCTION

VIDEO CALIBRATION ON
PICTURE CONTROL AUTO
AUTO TIMER OFF
→ SUPERIMPOSE ON
AUTO SP→EP TIMER OFF
NEXT PAGE
SELECT WITH [▲,▼] AND (OK)
PRESS (MENU) TO END

HR-VP473U



FUNCTION

VIDEO CALIBRATION ON
PICTURE CONTROL AUTO
AUTO TIMER OFF
→ SUPERIMPOSE ON
AUTO SP→EP TIMER OFF
VIDEO STABILIZER OFF
SELECT WITH [▲,▼] AND (OK)
PRESS (MENU) TO END

Move the highlight bar (arrow) to "SUPERIMPOSE" by pressing **CH▲▼** or **SHUTTLE PLUS△▽**, then press **OK** or **SHUTTLE PLUS ▷** to select the desired mode:

a– Select "ON" if you want the superimposed operational indications on the TV screen.
b– Select "OFF" if you do not want the superimposed operational indications on the screen.

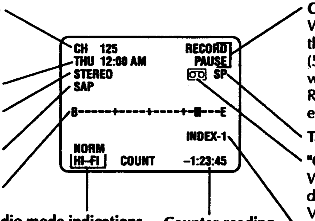
4 RETURN TO NORMAL SCREEN

Press **MENU**.

NOTES:

- *If you engage the Record Pause mode, RECORD/PAUSE is displayed regardless of the Superimpose mode setting.*
- *If you select a channel on which no signal is received, the channel number is displayed regardless of the Superimpose mode setting.*

The superimposed indication on the TV screen tells you what the VCR is doing.



Tuned-in channel or AUX(iliary) mode
When the channel is changed, the new channel is displayed on the screen for 5 seconds.

Clock time

Stereo program indication (HR-VP673U Only)

Second Audio Program indication (HR-VP673U Only)

Tape position indicator

Audio mode indications (HR-VP673U Only)

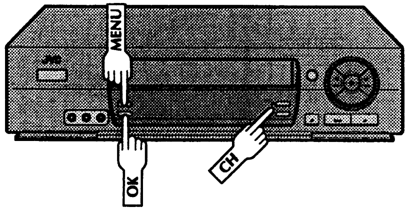
Counter reading

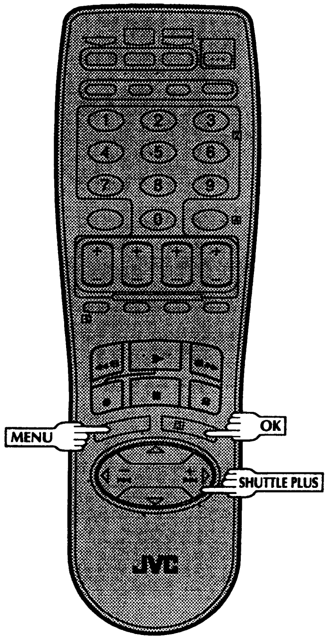
Operation mode
When the operation mode is changed, the new mode is displayed — RECORD (5 sec.), PLAY (5 sec.), FF/REW (5 sec. when engaged from Stop mode), RECORD PAUSE (for as long as Pause is engaged), and ITR *:** (5 sec.).

Tape speed indication

"Cassette Loaded" mark
When a cassette is loaded, the mark is displayed for 5 seconds. It blinks when the VCR's EJECT button is pushed.

INDEX indication





Select The Soundtrack (HR-VP673U Only)

Your VCR can record two soundtracks simultaneously (Normal and Hi-Fi) and play back the selected one, or both together. Or, when viewing a pre-recorded tape that contains two separate Hi-Fi audio programs, you can choose to listen to either one by selecting either "Hi-Fi L" or "Hi-Fi R" in step **3**.

1 ACCESS MAIN MENU SCREEN

Press **MENU**.

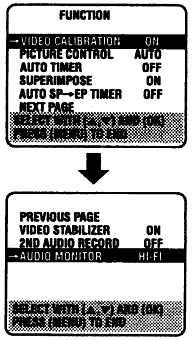
2 ACCESS FUNCTION SET SCREEN

Move the highlight bar (arrow) to "FUNCTION SET" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS ▷**.

3 SELECT AUDIO MONITOR SET MODE

Move the highlight bar (arrow) to "AUDIO MONITOR" by pressing **CH ▲▼** or **SHUTTLE PLUS** △▽, then press **OK** or **SHUTTLE PLUS ▷** to select the desired mode:

a– Hi-Fi
b– Hi-Fi L
c– Hi-Fi R
d– Normal
e– Mix



```
           FUNCTION

→VIDEO CALIBRATION       ON
 PICTURE CONTROL       AUTO
 AUTO TIMER             OFF
 SUPERIMPOSE             ON
 AUTO SP→EP TIMER       OFF
 NEXT PAGE
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END
```

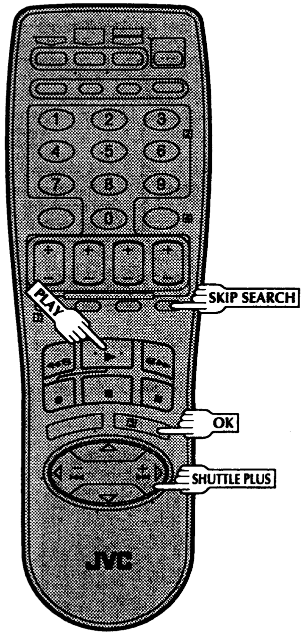
```
 PREVIOUS PAGE
 VIDEO STABILIZER        ON
 2ND AUDIO RECORD       OFF
→AUDIO MONITOR        HI-FI



SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END
```

4 RETURN TO NORMAL SCREEN

Press **MENU**.

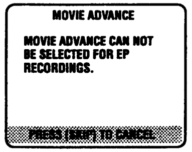
NOTES:

- *If the tape being played back has no Hi-Fi soundtrack, the Normal soundtrack will be heard no matter what choice you make in step **3**.*
- *If RF connection is used for TV, even if Hi-Fi audio monitor is selected the sound will be mono and will be reproduced in both loudspeakers.*



ATTENTION

Movie Advance works only on prerecorded cassettes that have been recorded in the SP mode, and have no safety tab. If the VCR detects the EP mode after you press **OK** in step **4**, the following screen appears.



```
        MOVIE ADVANCE

MOVIE ADVANCE CAN NOT
BE SELECTED FOR EP
RECORDINGS.



  PRESS (SKIP) TO CANCEL
```

NOTES:

- *Normally there is a period of black and no audio at the beginning and end of previews. The Movie Advance feature detects those parts where the picture fades to black and the audio fades to silence, and initiates fast-motion to skip over the detected previews.*
- *Some previews may not be detected and Movie Advance may not work properly.*
- *The setting you selected in step **3** remains in effect until the cassette is ejected.*

Movie Advance (HR-VP673U Only)

This feature helps you locate certain parts of prerecorded movies (rented or purchased) and works in two ways.

- You can go to the beginning of the movie, skipping over all previews.
- You can fast-motion the tape to the beginning of the next preview, so you can skip over previews one by one.

1 LOAD A CASSETTE

Insert a cassette that has a prerecorded movie (rented or purchased), with no safety tab, into the VCR. Playback begins automatically.

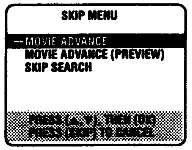
2 ACCESS SKIP MENU SCREEN

Press **SKIP SEARCH**.

3 SELECT MODE

Press **CH▲▼** or **SHUTTLE PLUS**△▽ to move the highlight bar (arrow) to your choice.

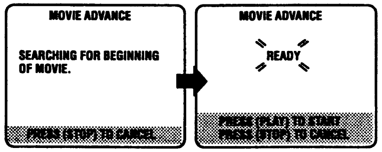
a– Select "MOVIE ADVANCE" if you want to advance directly to the beginning of the movie.
b– Select "MOVIE ADVANCE (PREVIEW)" if you want to advance to the next preview.
c– Select "SKIP SEARCH" if you do not want to perform Movie Advance, then press **OK** and the VCR enters stop mode. To activate the Skip Search function, see page 19.



```
          SKIP MENU

→MOVIE ADVANCE
 MOVIE ADVANCE (PREVIEW)
 SKIP SEARCH


  PRESS (▲,▼), THEN (OK)
  PRESS (SKIP) TO CANCEL
```

4 PERFORM MOVIE ADVANCE

a– If you selected "MOVIE ADVANCE" in step **3** and press **OK**, the following screen will appear with a blue background. The VCR will rewind the beginning of the tape, then will fast-motion to the beginning of the movie. "READY" will appear and blink when the beginning of the movie is detected and the Stop mode will be engaged. Press **PLAY** to view the movie.



```
     MOVIE ADVANCE

SEARCHING FOR BEGINNING
OF MOVIE.



  PRESS (STOP) TO CANCEL
```

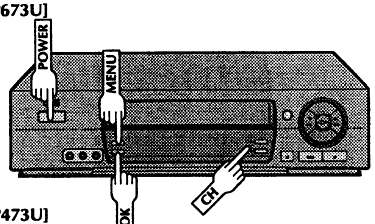
```
     MOVIE ADVANCE

        READY



  PRESS (PLAY) TO START
  PRESS (STOP) TO CANCEL
```

b– If you selected "MOVIE ADVANCE (PREVIEW)" in step **3** and press **OK**, the VCR will fast-motion to the beginning of the next preview and normal playback will resume when it is detected.
Each press of **SKIP SEARCH** fast-motions to the beginning of the next preview, thereby skipping over one preview each time.

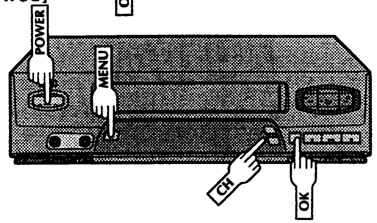
Active Video Calibration

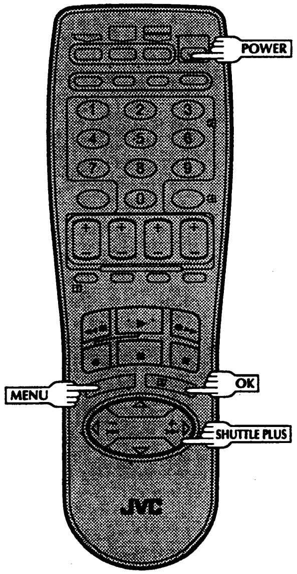
Turn on the TV and select the VCR channel 3 or 4 (or AV mode).

[VP673U]



[VP473U]





Active Video Calibration checks the condition of the tape during recording and playback, and compensates for poor reproduction to provide the best quality recording and playback pictures. *The default setting is "ON".

Preparation

1 TURN ON THE VCR

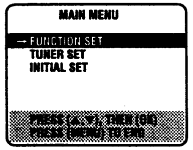
Press **POWER**.

2 ACCESS MAIN MENU SCREEN

Press **MENU**.

3 ACCESS FUNCTION SET SCREEN

Press **CH▲▼** or **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "FUNCTION SET", then press **OK** or **SHUTTLE PLUS** ▷.

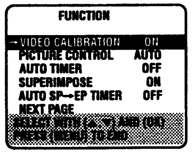

MAIN MENU

→ FUNCTION SET
TUNER SET
INITIAL SET

PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END

4 SELECT VIDEO CALIBRATION MODE

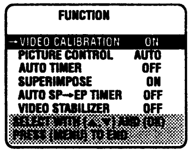
HR-VP673U


FUNCTION

→ VIDEO CALIBRATION	ON
PICTURE CONTROL	AUTO
AUTO TIMER	OFF
SUPERIMPOSE	ON
AUTO SP→EP TIMER	OFF
NEXT PAGE	

SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

HR-VP473U


FUNCTION

→ VIDEO CALIBRATION	ON
PICTURE CONTROL	AUTO
AUTO TIMER	OFF
SUPERIMPOSE	ON
AUTO SP→EP TIMER	OFF
VIDEO STABILIZER	OFF

SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

Press **CH ▲▼** or **SHUTTLE PLUS** △▽ to move the highlight bar (arrow) to "VIDEO CALIBRATION", then press **OK** or **SHUTTLE PLUS** ▷ to set to "ON" or "OFF".

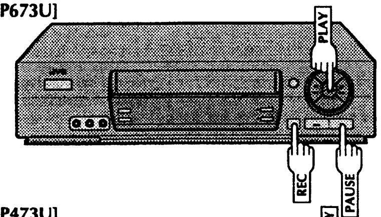
NOTE:

When recording or when playing back tapes recorded on this VCR set the Video Calibration to "ON".

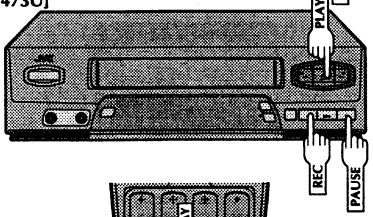
5 RETURN TO NORMAL SCREEN

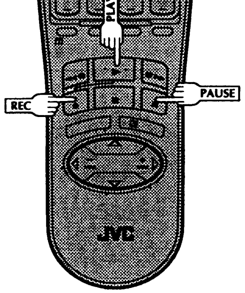
Press **MENU**.

[VP673U]



[VP473U]





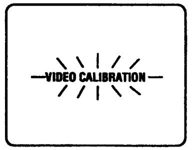
Playback

The VCR assesses the quality of the tape once you start playback.

Perform steps **1** and **2** on page 16 ("Simple Playback") before continuing.

1 START PLAYBACK

Press **PLAY**.


—VIDEO CALIBRATION—

- The VCR adjusts the playback picture quality based on the quality of the tape in use.

NOTES:

- *When using rental tapes, or tapes recorded on other VCRs, set "VIDEO CALIBRATION" in step **4** of the Preparation procedure to either "ON" or "OFF" as desired to give the best picture (☞ pg. 26).*
- *The Video Calibration screen only appears at the beginning of automatic tracking. Even though the screen doesn't appear after that, the Video calibration function is operative.*
- *To display the Video Calibration screen, "SUPERIMPOSE" must be set to "ON" or the Video Calibration screen will not appear (☞ pg. 23).*

Recording

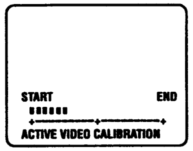
Perform steps **1** – **3** on page 17 ("Simple Recording") before continuing.

1 START RECORDING

Press and hold **REC** and press **PLAY** on the remote control, or press **REC** on the VCR's front panel.

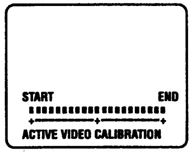
- The VCR takes about 7 seconds to assess the quality of the tape in use, then recording begins with the picture level optimized.

DURING CALIBRATION


START END

ACTIVE VIDEO CALIBRATION

CALIBRATION COMPLETE


START END

ACTIVE VIDEO CALIBRATION

NOTES:

- *Calibration occurs immediately prior to both the first SP and the first EP recording after inserting the cassette. It does not take place during recording.*
- *In the case of timer recording, calibration takes place for both SP and EP before the first timer recording after inserting the cassette (regardless of the tape speed selected for that recording).*
- *Once the cassette is ejected, the calibration data is canceled. The next time the cassette is used for recording, calibration is re-performed.*
- *While Video Calibration is operative, the **PAUSE** button will not function.*
- *To display the Video Calibration screen, "SUPERIMPOSE" must be set to "ON" or the Video Calibration screen will not appear (☞ pg. 23).*

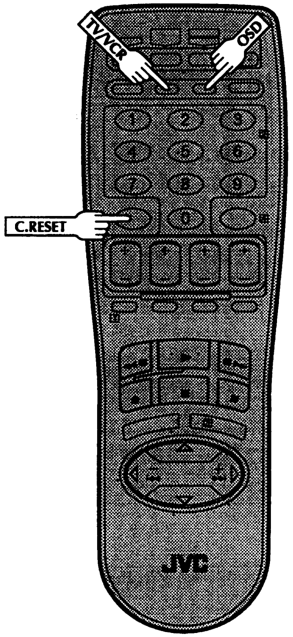
ATTENTION:

- ■ As calibration takes place before recording actually starts, there is a delay of about 7 seconds after **REC** and **PLAY** on the remote, or **REC** on the VCR's front panel, are pressed. To make sure you record the desired scene or program completely, first perform the following steps:

1) Press and hold **PAUSE**, and press **REC** to engage the RECORD PAUSE mode.
   - The VCR then automatically checks the condition of the tape and, after about 7 seconds, re-enters RECORD PAUSE.
2) Press **PLAY** to start recording.

- ■ If you want to bypass Video Calibration and start recording right away, set "VIDEO CALIBRATION" to "OFF" in step **4** of the Preparation procedure (☞ pg. 26).

Recording Features



Record One Program While Watching Another

1 ENGAGE TV MODE

During recording...

- Press **TV/VCR**. The VCR's VCR indicator goes out. (If you are using the RF connection (☞ pg. 6) to view the output from your VCR, the TV broadcast being recorded disappears.)
- If you are using the AV connection (☞ pg. 6) to view the output from your VCR, change the TV's input mode from AV to TV.

2 SELECT CHANNEL FOR VIEWING

Use the TV's channel selector to set the channel you want to watch.

Display Elapsed Recording Time

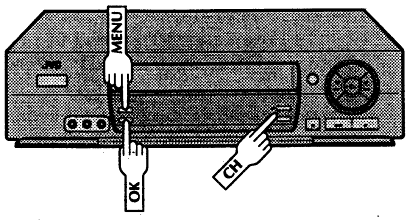
1 RESET COUNTER TO ZERO

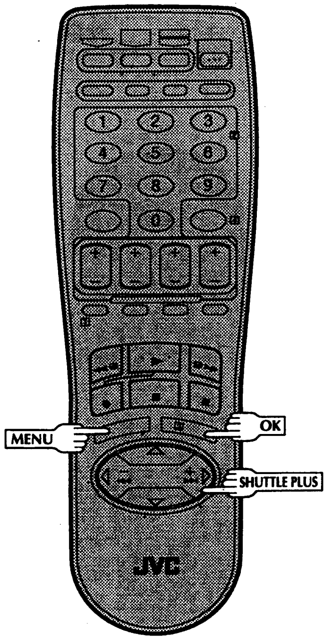
Before recording starts, press **C.RESET**. The counter resets to zero and displays the exact elapsed time as the tape runs.

2 DISPLAY ELAPSED TIME ON SCREEN

During recording, press **OSD** at any time to see the elapsed time.
All indications corresponding to the current status of the VCR are displayed for 5 seconds. The counter display remains on the screen indicating the elapsed time.
Press **OSD** again to remove the display.

- Make sure "SUPERIMPOSE" is set to "ON" (☞ pg. 23).
- The indications are not recorded.





NOTES:

- *If a SAP program is received and "2ND AUDIO RECORD" is set to "ON", the SAP audio is recorded on both the Normal and Hi-Fi tracks. The main audio program is not recorded.*
- *If a non-SAP program is received, the main audio is recorded on both the Hi-Fi and Normal audio tracks.*

Stereo And SAP (Second Audio Program) (HR-VP673U Only)

Your VCR's built-in MTS decoder enables reception of Multi-channel TV Sound broadcasts.
When the channel is changed...

- The "STEREO" indication appears on the screen for about 5 seconds if the program is a stereo broadcast.
- The "SAP" indication appears on the screen for about 5 seconds if the program is an SAP broadcast.
- Both indications appear when a stereo program is accompanied by SAP audio.

To Record Stereo Programs . . .
. . . simply follow the basic recording procedure.

To Listen To Stereo Soundtrack During Recording . . .
. . . set "AUDIO MONITOR" to "HI-FI" at the Function screen (☞ pg. 24).

To Record SAP Programs . . . (HR-VP673U Only)

1 ACCESS MAIN MENU SCREEN

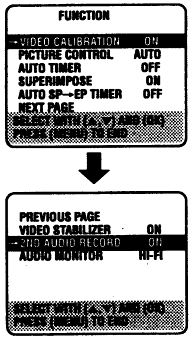
Press **MENU**.

2 ACCESS FUNCTION SET SCREEN

Move the highlight bar (arrow) to "FUNCTION SET" by pressing **CH▲▼** or **SHUTTLE PLUS△▽**, then press **OK** or **SHUTTLE PLUS ▷**.

3 SELECT 2ND AUDIO RECORD SET MODE

Move the highlight bar (arrow) to "2ND AUDIO RECORD" by pressing **CH ▲▼** or **SHUTTLE PLUS △▽**, then press **OK** or **SHUTTLE PLUS ▷** to set to "ON".



```
            FUNCTION
→VIDEO CALIBRATION        ON
 PICTURE CONTROL        AUTO
 AUTO TIMER              OFF
 SUPERIMPOSE              ON
 AUTO SP→EP TIMER        OFF
 NEXT PAGE
SELECT WITH [▲,▼] AND (OK)
PRESS (MENU) TO END
```

```
 PREVIOUS PAGE
 VIDEO STABILIZER         ON
→2ND AUDIO RECORD         ON
 AUDIO MONITOR         HI-FI

SELECT WITH [▲,▼] AND (OK)
PRESS (MENU) TO END
```

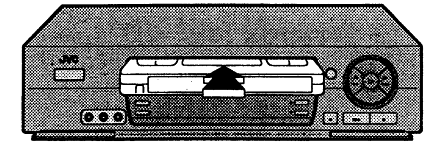
4 RETURN TO NORMAL SCREEN

Press **MENU**.

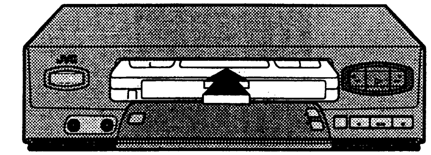
VCR Plus+ Timer Programming

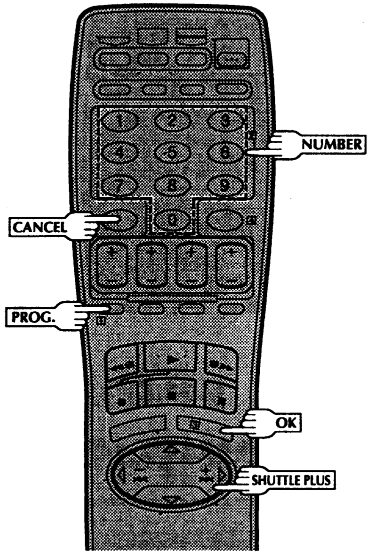
Turn on the TV and select the VCR channel 3 or 4 (or AV mode).

[VP673U]



[VP473U]




NUMBER
CANCEL
PROG.
OK
SHUTTLE PLUS

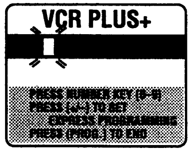
Timer recording allows you to program the VCR to automatically record a program that will be broadcast at some future time.
The timer record function can be programmed using VCR Plus+ or Express Timer programming up to 8 shows as far as a year in advance. (☞ pg. 30 or 34)
The VCR Plus+ timer programming system eliminates the need to input channel, date, start and stop time data when setting the timer record function. Simply key in the PlusCode number for the TV program you wish to record and the VCR's timer will be automatically programmed. (The PlusCode programming numbers are the numbers next to the programs in most TV listing.)

1 LOAD A CASSETTE

Make sure the record safety tab is present.

- The VCR's power comes on automatically.

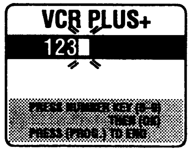
2 ACCESS VCR PLUS+ SCREEN


VCR PLUS+
PRESS NUMBER KEY (0-9)
PRESS (+/-) TO SET
EXPRESS PROGRAMMING
PRESS (PROG.) TO END

Press **PROG.** on the remote control.

- The clock must be set in order to access the VCR Plus+ screen. If you haven't set the clock, the Main Menu screen appears after an error message is displayed.
  Refer to page 8 for the Plug & Play procedure or page 11 for the clock setting procedure.

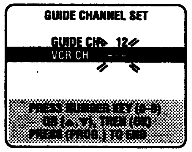
3 ENTER PLUSCODE NUMBER


VCR PLUS+
123
PRESS NUMBER KEY (0-9)
THEN (OK)
PRESS (PROG.) TO END

Press the appropriate **NUMBER** keys to enter the PlusCode number printed in the TV listings for the TV program you wish to record and press **OK**.
If the Guide Channel Set screen appears, go to step 4.
If the VCR Plus+ program screen appears, go to step 5.

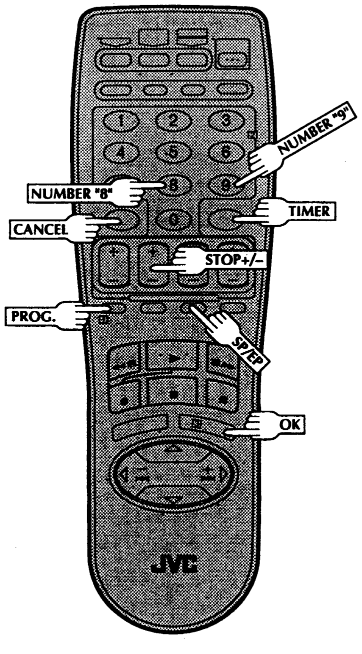
- To make corrections, press **CANCEL** and input the correct PlusCode number.

4 INPUT RECEIVING CHANNEL NUMBER


GUIDE CHANNEL SET
GUIDE CH 12
VCR CH - - -
PRESS NUMBER KEY (0-9)
OR (▲, ▼), THEN (OK)
PRESS (PROG.) TO END

The Guide Channel Number, which is assigned to the TV or cable station for the PlusCode number that you entered in step **3**, will appear automatically on the Guide Channel Set screen. Input the number of the channel on which the broadcast for the PlusCode number is received on the VCR or cable box using the **NUMBER** keys, **CH ▲▼** or **SHUTTLE PLUS △▽**, then press **OK**.

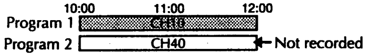
- The Guide Channel Set screen appears only when you input the PlusCode number of a station for which the Guide Channel number has not been set already.


NUMBER "9"
NUMBER "8"
TIMER
CANCEL
STOP+/–
PROG.
SP/EP
OK
JVC

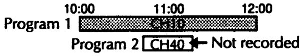
ATTENTION

If there is a conflict in the timer schedule and one program overlaps with another, only the parts shown below in gray will be recorded.

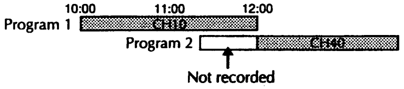
Pattern 1: *The program with the lower program number will be recorded.*


10:00
11:00
12:00
Program 1
CH10
Program 2
CH40
Not recorded

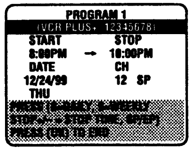
Pattern 2: *The program that is broadcast earlier will be recorded.*


10:00
11:00
12:00
Program 1
CH10
Program 2
CH40
Not recorded

Pattern 3: *The program that is broadcast earlier will be recorded, followed by the remaining portion of the other program.*


10:00
11:00
12:00
Program 1
CH10
Program 2
CH40
Not recorded

5 CHECK PROGRAM DATA


PROGRAM 1
(VCR PLUS+ 12345678)
START
STOP
8:00PM → 10:00PM
DATE
CH
12/24/99
12 SP
THU
PRESS (8=DAILY, 9=WEEKLY
STOP+/– = STOP TIME, SP/EP)
PRESS (OK) TO END

The PlusCode number you entered and the matching Timer-Recording information is displayed on the Program screen. Check to make sure it's accurate.

- To change the stop time, press **STOP +/–**.
- To timer-record daily or weekly serials, press **DAILY (NUMBER "8")** or **WEEKLY (NUMBER "9")**. "DAILY" or "WEEKLY" appears on the Program screen. Pressing the button again makes each corresponding display disappear.
- If you made a mistake, press **CANCEL** to access the VCR Plus+ screen again and input the correct PlusCode number.
- If the PlusCode number you inputted is incorrect, "ERROR" may appear on the screen to advise you of the error. This happens when the PlusCode number is for a program which has already passed. "ERROR" is displayed for about 5 seconds and the VCR Plus+ screen reappears.

6 SET TAPE SPEED

Press **SP/EP**.

7 RETURN TO NORMAL SCREEN

Press **PROG.** or **OK**. "PROGRAM COMPLETED" appears on the screen for about 5 seconds, then normal screen appears.

8 ENGAGE TIMER MODE

Press **TIMER**. The VCR turns off automatically and "⊙" is displayed on the display panel.

IMPORTANT

If you have moved to a different area or if a broadcasting station's channel number has been changed, the wrong VCR or CABLE CH number will be displayed on the VCR Plus+ program screen in step **5**. When this happens, set the correct Guide Channel number for that station. (☞ pg. 32, "VCR Plus+ Setup")

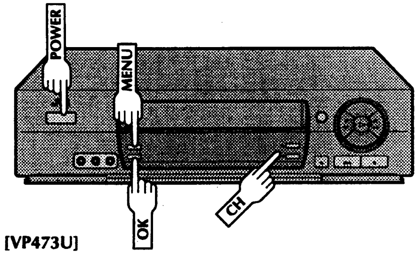
NOTES:

- *To disengage the timer before recording starts, press **TIMER** again. Pressing once more re-engages it.*
- *In case of a power failure after programming, the VCR's memory backup keeps your selections for approximately 10 minutes.*

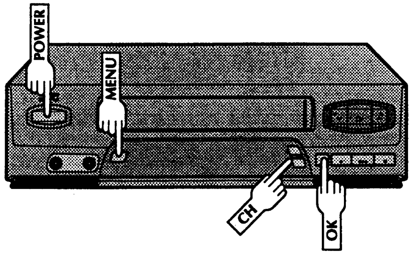
VCR Plus+ Setup

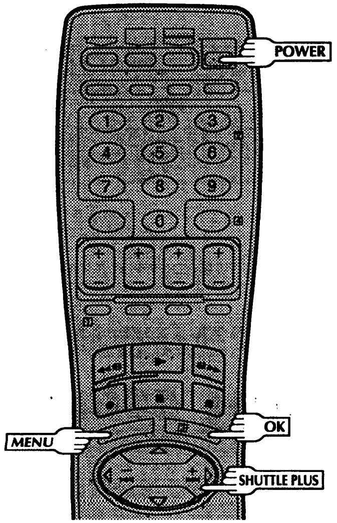
Turn on the TV and select the VCR channel 3 or 4 (or AV mode).

[VP673U]



[VP473U]





IMPORTANT

If you have moved to a different area or if a broadcasting station's channel number has been changed, the wrong VCR or CABLE CH number will be displayed on the VCR Plus+ program screen (☞ step **5** on page 31). When this happens, perform the following steps to set the correct Guide Channel number for that station.

To ensure that VCR Plus+Timer Recording operates correctly it is necessary to set the VCR Plus+ "Guide Channel Set " for each station. Please read the following information carefully.

VCR Plus+ Guide Channel Matching

The VCR Plus+ programming system assigns a VCR Plus+ "Guide Channel" to broadcast and cable TV channels. These Guide Channel numbers are also called the VCR Plus+ Channel Codes. Most TV listings have a section, usually a chart, indicating the "Guide Channel" numbers assigned to each station. For accurate VCR Plus+ programming the VCR Plus+ Guide Channel number for each station should match the channel number on which it is received in your area.

NOTES:

- *In many instances the VCR Plus+ Guide Channel numbers for cable and broadcast TV stations **DO NOT** match the channel number on which it is received by your VCR or cable box. Check your TV listing, or contact your cable supplier for details.*
- *Many broadcast TV stations can be viewed on cable. Check your TV listing, or contact your cable supplier for details.*

1

TURN ON THE VCR

Press **POWER**.

2

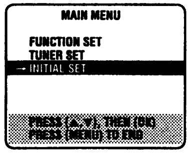
ACCESS MAIN MENU SCREEN

Press **MENU**.

3

ACCESS INITIAL SET SCREEN

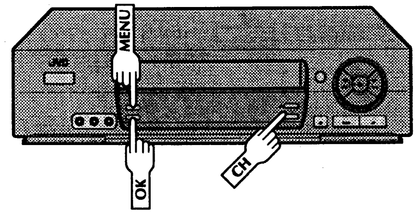
Press **CH▲▼** or **SHUTTLE PLUS**△▽ to move the highlight bar (arrow) to "INITIAL SET", then press **OK** or **SHUTTLE PLUS** ▷.


MAIN MENU

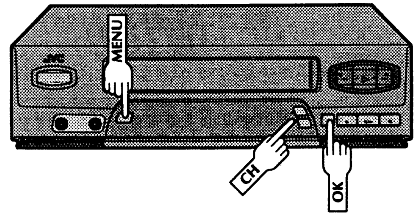
FUNCTION SET
TUNER SET
→ INITIAL SET

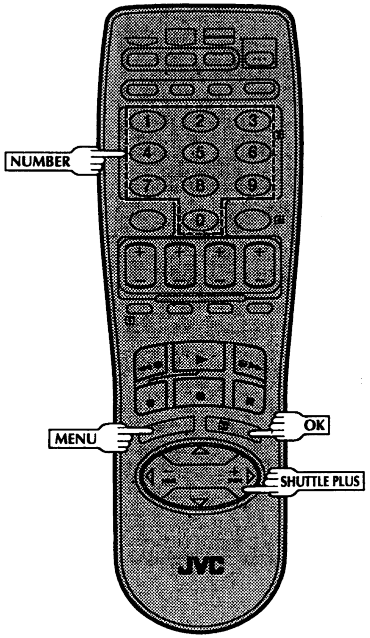
PRESS (▲,▼), THEN (OK)
PRESS (MENU) TO END

[VP673U]



[VP473U]

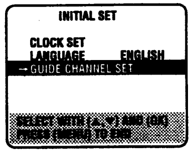




4

ACCESS GUIDE CHANNEL SET SCREEN

Press **CH▲▼** or **SHUTTLE PLUS**△▽ to move the highlight bar (arrow) to "GUIDE CHANNEL SET", then press **OK** or **SHUTTLE PLUS** ▷.


INITIAL SET

CLOCK SET
LANGUAGE ENGLISH
→ GUIDE CHANNEL SET

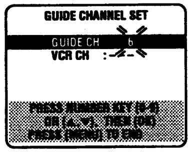
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END

5

INPUT GUIDE CHANNEL NUMBER

Press **CH▲▼**, **SHUTTLE PLUS**△▽ or the appropriate **NUMBER** keys to input the VCR Plus+ Guide Channel number as shown in the TV listing. Then press **OK** or **SHUTTLE PLUS** ▷.

(Ex.) When inputting the Guide Channel number 6 for WNJU(Ind.)


GUIDE CHANNEL SET

GUIDE CH 6
VCR CH : – –

PRESS NUMBER KEY (0-9)
OR (▲,▼), THEN (OK)
PRESS (MENU) TO END

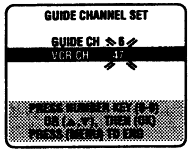
6

INPUT RECEIVING CHANNEL NUMBER

Press **CH▲▼**, **SHUTTLE PLUS**△▽ or the appropriate **NUMBER** keys to input the number of the channel on which the Guide Channel's broadcasts are received. Then press **OK** or **SHUTTLE PLUS**▷.

- Repeat steps **5** and **6** for each instance.

(Ex.) If WNJU(Ind.) is received on channel 47


GUIDE CHANNEL SET

GUIDE CH : 6
VCR CH 47

PRESS NUMBER KEY (0-9)
OR (▲,▼), THEN (OK)
PRESS (MENU) TO END

7

RETURN TO NORMAL SCREEN

Press **MENU**.

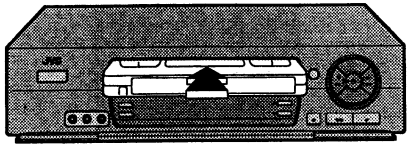
ATTENTION CABLE BOX SUBSCRIBERS

- In order to set the Guide Channel for a cable program, you must select your cable box's output channel as the VCR channel in step **6**. If the cable box is connected to your VCR's ANT. IN connector, select the cable box's RF output channel. If the cable box is connected to your VCR's VIDEO IN and AUDIO IN connectors, press **NUMBER** key "0" to select "F-1" as the VCR channel.
- It is important that you keep the cable box ON and tuned to the cable station of the program you want to record until timer recording is completed.

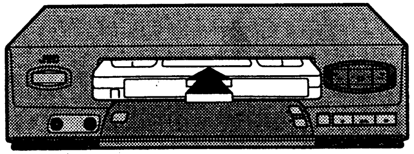
Express Timer Programming

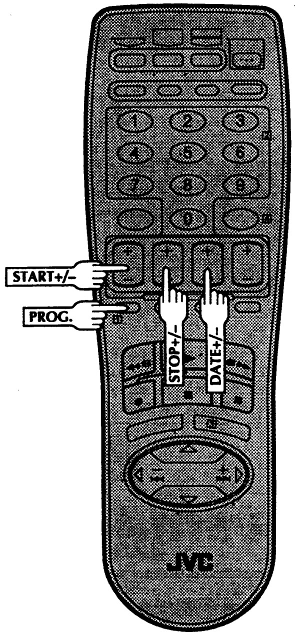
Turn on the TV and select the VCR channel 3 or 4 (or AV mode).

[VP673U]



[VP473U]





You can directly program the VCR's timer to record up to 8 shows, as far as a year in advance. Remember, the clock must be set before you can program the timer (☞ pg. 8 or 11).

1 LOAD A CASSETTE

Make sure the record safety tab is intact. If not, cover the hole with adhesive tape, then load it into the VCR.

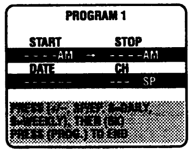
- The VCR comes on, and the counter is reset, automatically.

2 ACCESS VCR PLUS+ SCREEN

Press **PROG.**

3 ACCESS PROGRAM SCREEN

Press **START +/–**. (If you're just starting out, "PROGRAM 1" appears.)

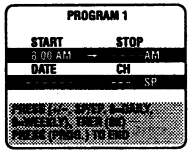


PROGRAM 1
START STOP
- - - -AM → - - - -AM
DATE CH
- - - - - - - - - SP

4 SET PROGRAM START TIME

Press **START +/–** to enter the time you want recording to start.

- Press and hold **START +/–** to move in 30-minute increments, or press and release repeatedly to move 1 minute at a time.



PROGRAM 1
START STOP
6 00 AM → - - - -AM
DATE CH
- - - - - - - - - SP

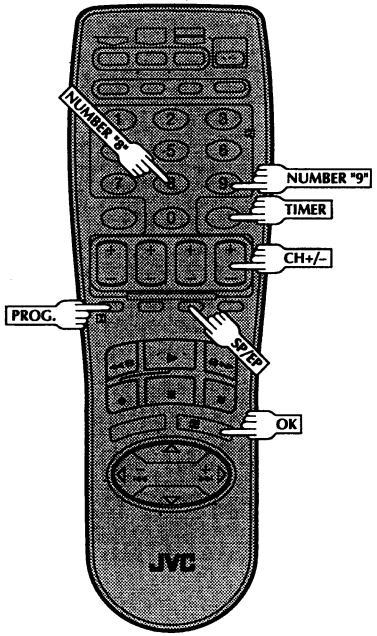
5 SET PROGRAM STOP TIME

Press **STOP +/–** to enter the time you want recording to stop.

- Press and hold **STOP +/–** to move in 30-minute increments, or press and release repeatedly to move 1 minute at a time.

6 SET PROGRAM DATE

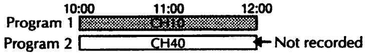
Press **DATE +/–**. (The current date is displayed on screen. The date you enter appears in its place.)



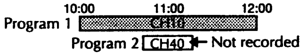
ATTENTION

If there is a conflict in the timer schedule and one program overlaps with another, only the parts shown below in gray will be recorded.

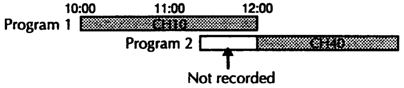
Pattern 1: *The program with the lower program number will be recorded.*



Pattern 2: *The program that is broadcast earlier will be recorded.*



Pattern 3: *The program that is broadcast earlier will be recorded, followed by the remaining portion of the other program.*



7 SET CHANNEL NUMBER

Press **CH +/–**.

- Holding down **CH +/–** rapidly scans through the channels.
- If you are using a cable box, enter the cable box channel, not the channel to be recorded. The channel to be recorded must be selected on the cable box. (The cable box channel is the VCR's channel that displays the channels received by the cable box.)
- To timer-record cable or DBS channels through an external tuner connected to the VCR's external input connectors, press the **NUMBER** key "0" so that "F-1" appears instead of a channel number.

8 SET TAPE SPEED

Press **SP/EP** to set the tape speed.

9 RETURN TO NORMAL SCREEN

Press **PROG.** or **OK**. "PROGRAM COMPLETED" appears on the screen for about 5 seconds, then normal screen appears.

10 ENGAGE TIMER MODE

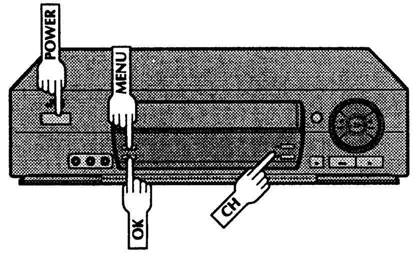
Press **TIMER**. The VCR turns off automatically and "⊙" is displayed on the display panel.

To Timer-Record Weekly Or Daily Serials . . .
. . . anytime during steps **3** through **9**, press **WEEKLY** (**NUMBER** key "9") for weekly serials or **DAILY** (**NUMBER** key "8") for daily serials (Monday–Friday). Either "WEEKLY" or "DAILY" appears on the screen. Pressing the button again makes the corresponding indication disappear.

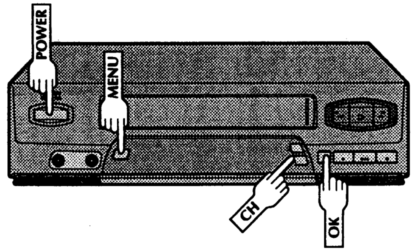
NOTES:

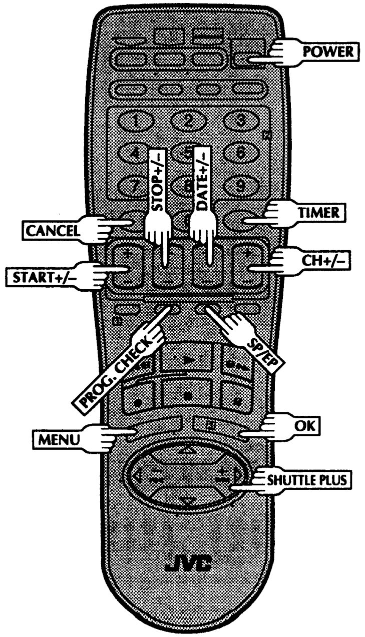
- *To disengage the timer before recording starts, press* ***TIMER*** *again. Pressing once more re-engages it.*
- *In case of a power failure after programming, the VCR's memory backup keeps your selections for approximately 10 minutes.*
- *Programs that start after midnight must have the next day's date.*
- *After timer recording is completed, the VCR's power goes off automatically.*
- *You can program the timer while a regular recording is in progress; the on-screen menu will not be recorded.*
- *If the end of tape is reached during timer recording, the cassette is automatically ejected.*
- *When timer-recording cable or satellite channels through an external tuner, be sure to keep the cable box or satellite receiver's power ON.*

[VP673U]



[VP473U]





Check, Cancel And Revise Programs

1

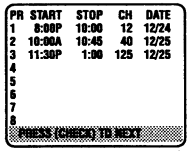
DISENGAGE TIMER

Press **TIMER**, then press **POWER.**

2

ACCESS PROGRAM CHECK SCREEN

Press **PROG. CHECK**.



```
PR START  STOP  CH  DATE
1   8:00P 10:00  12 12/24
2 10:00A  10:45  40 12/25
3 11:30P   1:00 125 12/25
4
5
6
7
8
 PRESS (CHECK) TO NEXT
```

3

ACCESS PROGRAM SCREEN

Press **PROG. CHECK** again to check more information. Each time you press **PROG. CHECK**, the next program's information appears.

To Cancel Or Revise A Program...

4

CANCEL OR REVISE A PROGRAM

To cancel a program, press **CANCEL**.
To revise a program, press the appropriate button: **START+/–, STOP+/–, DATE+/–, CH+/–, SP/EP.**

5

RETURN TO NORMAL SCREEN

Press **PROG. CHECK** as many times as necessary. If there are still programs remaining, go to step **6.**

6

RE-ENGAGE TIMER

Press **TIMER.**

Auto SP→EP Timer

If, when recording in SP mode, there is not enough tape to record the entire program, the VCR automatically switches to EP mode to allow complete recording. This feature is especially handy when recording a program of more than 2 hours in length.

For Example . . .

Recording a program of 140 minutes in length onto a 120-minute tape

Approximately 110 minutes	Approximately 30 minutes
SP mode	EP mode

Total 140 minutes

Make sure you set "AUTO SP→EP TIMER" to "ON" at the Function screen before the timer recording starts.

1

ACCESS MAIN MENU SCREEN

Press MENU.

2

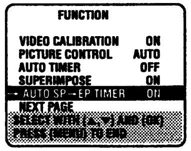
ACCESS FUNCTION SET SCREEN

Move the highlight bar (arrow) to "FUNCTION SET" by pressing **CH ▲▼** or **SHUTTLE PLUS** △▽, then press **OK** or **SHUTTLE PLUS ▷**.

3

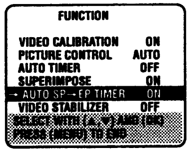
SELECT AUTO SP→EP TIMER SET MODE

HR-VP673U



```
           FUNCTION

 VIDEO CALIBRATION      ON
 PICTURE CONTROL      AUTO
 AUTO TIMER            OFF
 SUPERIMPOSE            ON
→AUTO SP→EP TIMER       ON
 NEXT PAGE
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END
```

HR-VP473U



```
           FUNCTION

 VIDEO CALIBRATION      ON
 PICTURE CONTROL      AUTO
 AUTO TIMER            OFF
 SUPERIMPOSE            ON
→AUTO SP→EP TIMER       ON
 VIDEO STABILIZER      OFF
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END
```

Move the highlight bar (arrow) to "AUTO SP→EP TIMER" by pressing **CH ▲▼** or **SHUTTLE PLUS** △▽, then press **OK** or **SHUTTLE PLUS ▷** to set to "ON".

4

RETURN TO NORMAL SCREEN

Press MENU.

NOTES:

- *If you have programmed the VCR to timer-record 2 or more programs, the second program and those thereafter may not fit on the tape though you set the Auto SP→EP Timer mode to "ON". In this case, make sure the mode is not engaged, then set the tape speed manually during timer programming.*
- *In order to ensure that the recording fits on the tape, this feature may leave a slight non-recorded section at the end of the tape.*
- *There may be some noise at the point on the tape where the VCR switches from SP to EP mode.*
- *The Auto SP→EP Timer feature is not available during ITR (Instant Timer Recording), and the feature will work with the following tapes: T(ST)-30, T(ST)-60, T(ST)-90, and T(ST)-120.*

Auto Timer

When the Auto Timer is set to "ON" the timer is automatically engaged when the VCR's power is turned off. It is automatically disengaged when the VCR is powered back on.

1

ACCESS MAIN MENU SCREEN

Press **MENU.**

2

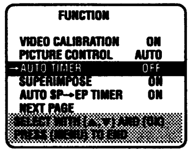
ACCESS FUNCTION SET SCREEN

Move the highlight bar (arrow) to "FUNCTION SET" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS ▷.**

3

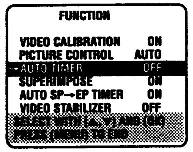
SELECT AUTO TIMER SET MODE

HR-VP673U



```
           FUNCTION

 VIDEO CALIBRATION      ON
 PICTURE CONTROL      AUTO
→AUTO TIMER            OFF
 SUPERIMPOSE            ON
 AUTO SP→EP TIMER       ON
 NEXT PAGE
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END
```

HR-VP473U



```
           FUNCTION

 VIDEO CALIBRATION      ON
 PICTURE CONTROL      AUTO
→AUTO TIMER            OFF
 SUPERIMPOSE            ON
 AUTO SP→EP TIMER       ON
 VIDEO STABILIZER      OFF
SELECT WITH (▲,▼) AND (OK)
PRESS (MENU) TO END
```

Move the highlight bar (arrow) to "AUTO TIMER" by pressing **CH▲▼** or **SHUTTLE PLUS**△▽, then press **OK** or **SHUTTLE PLUS ▷** to set to "ON" or "OFF".

4

RETURN TO NORMAL SCREEN

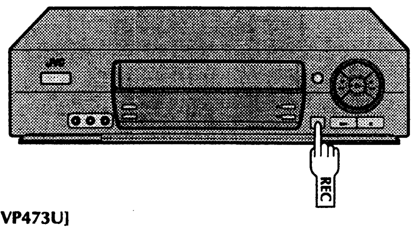
Press **MENU.**

NOTE:

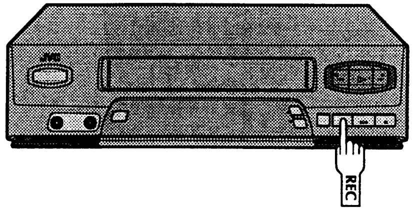
For safety, when AUTO TIMER is set to "OFF", all other VCR functions are disabled while the Timer mode is engaged. To disengage the timer, press ***TIMER.***

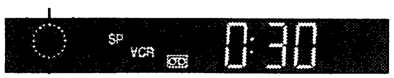
Instant Timer Recording (ITR)

[VP673U]



[VP473U]





This easy method lets you record from 30 minutes to 6 hours (selectable in 30-min. increments) and shuts the VCR off after recording is finished.

1
START RECORDING

Press **REC** on the front panel.

2
ENGAGE ITR MODE

Press **REC** again. "○ " blinks and 0:30 appears on the front display panel.

3
SET RECORDING DURATION

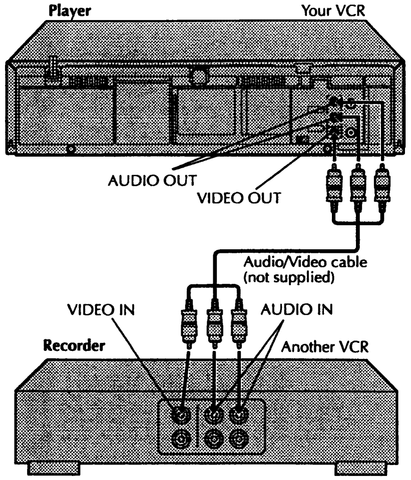
If you want to record for more than 30 minutes, press **REC** to extend the time. Each press extends recording time by 30 minutes.

NOTES:

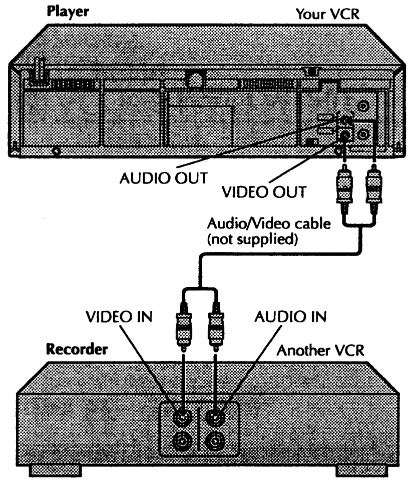
- *You can only perform ITR using the **REC** button on the VCR's front panel.*
- *After you set the ITR time, the previous display reappears.*
- *To check the remaining time, press **REC** once during recording and the remaining time will be displayed for about 5 seconds. Be careful not to press **REC** again within these 5 seconds, or you will round the recording time up to the next 30 minute increment.*

Edit To Another VCR

[VP673U]


Player
Your VCR
AUDIO OUT
VIDEO OUT
Audio/Video cable
(not supplied)
VIDEO IN
AUDIO IN
Recorder
Another VCR

[VP473U]


Player
Your VCR
AUDIO OUT
VIDEO OUT
Audio/Video cable
(not supplied)
VIDEO IN
AUDIO IN
Recorder
Another VCR

You can use your VCR as the player and another VCR as the recorder.

1
MAKE CONNECTIONS

Connect an AV cable between your VCR's VIDEO OUT and AUDIO OUT connectors and another VCR's VIDEO IN and AUDIO IN connectors.

For HR-VP673U owners...

- When connecting to a monaural VCR, connect your VCR's AUDIO OUT L connector to the AUDIO IN connector on the monaural VCR.

For HR-VP473U owners...

- When connecting to a Hi-Fi VCR, connect your VCR's AUDIO OUT connector to the AUDIO IN L connector on the Hi-Fi VCR.

2
LOAD CASSETTES

Insert the playback cassette into your VCR and the cassette to be recorded on into the other VCR.

3
SET RECORDER'S INPUT MODE

Set the other VCR's auxiliary (AV) input mode.

4
SELECT "EDIT" FOR PICTURE CONTROL SET MODE

Follow the "Picture Control" section on page 20, then select "EDIT."

NOTE:

When you select "EDIT" to dub tapes, be sure to select AUTO or (NORM when VIDEO CALIBRATION is set to OFF) after you finish dubbing the tapes.

5
START PLAYER

Set to its play mode.

NOTE:

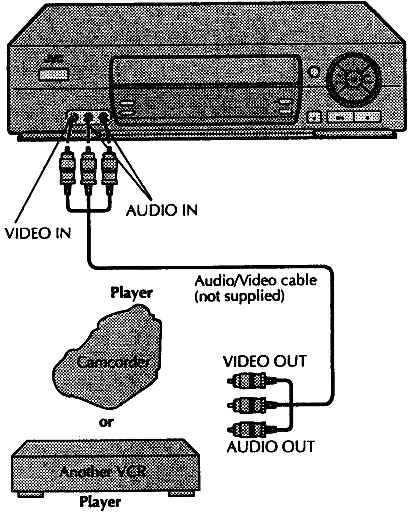
*If the player is equipped with a superimpose/OSD disable feature then set "SUPERIMPOSE" to OFF before pressing **PLAY** (☞ pg. 23).*

6
START RECORDER

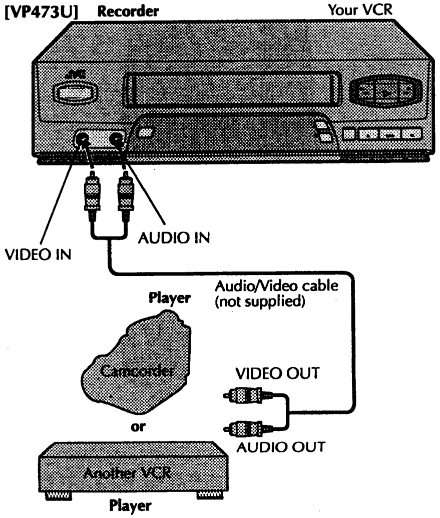
Set to its record mode.

Edit From A Camcorder Or Another VCR

[VP673U]


Recorder
Your VCR
AUDIO IN
VIDEO IN
Player
Audio/Video cable
(not supplied)
Camcorder
VIDEO OUT
or
AUDIO OUT
Another VCR
Player

[VP473U]


Recorder
Your VCR
AUDIO IN
VIDEO IN
Player
Audio/Video cable
(not supplied)
Camcorder
VIDEO OUT
or
AUDIO OUT
Another VCR
Player

You can use a camcorder or another VCR as the player and your VCR as the recorder.

1 MAKE CONNECTIONS

Connect an AV cable between the camcorder's or the playback VCR's VIDEO OUT and AUDIO OUT connectors and your VCR's VIDEO IN and AUDIO IN connectors.

For HR-VP673U owners...
- When using a monaural camcorder or a monaural VCR, connect its AUDIO OUT connector to the AUDIO IN L connector on your VCR.

For HR-VP473U owners...
- When using a Hi-Fi camcorder or a Hi-Fi VCR, connect its AUDIO OUT L connector to the AUDIO IN connector on your VCR.

2 LOAD A CASSETTES

Insert the cassette to be recorded on into your VCR and the playback cassette into the camcorder or the playback VCR.

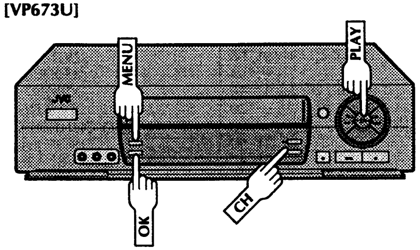
3 SELECT "EDIT" FOR PICTURE CONTROL SET MODE

Follow the "Picture Control" section on page 20, then select "EDIT."

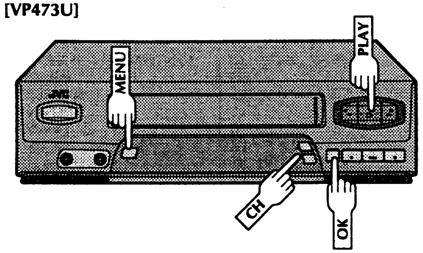
NOTE:

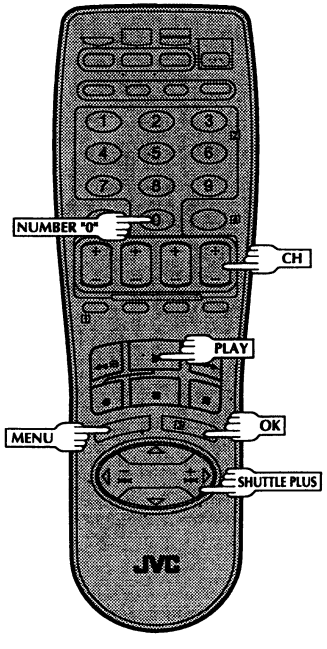
When you select "EDIT" to dub tapes, be sure to select AUTO or (NORM when VIDEO CALIBRATION is set to OFF) after you finish dubbing the tapes.

[VP673U]


MENU
PLAY
OK
CH

[VP473U]


MENU
PLAY
CH
OK


NUMBER "0"
CH
PLAY
MENU
OK
SHUTTLE PLUS
JVC

4 SET RECORDER'S INPUT MODE

Set to "AUX". Press the **NUMBER** key "0" and/or **CH** to select "F-1".

5 START PLAYER

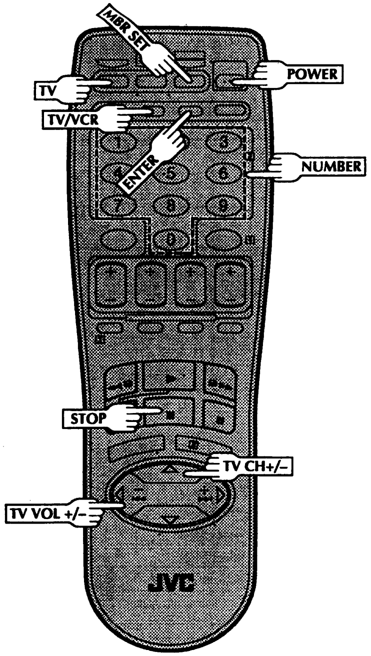
Set the camcorder to its play mode.

NOTE:

If the camcorder is equipped with a superimpose/OSD disable feature then set its superimpose or display feature to OFF before pressing play.

6 START RECORDER

Set your VCR to its record mode.



TV BRAND NAME	BRAND CODE
JVC	01
MAGNAVOX	02
MITSUBISHI	03
PANASONIC	04, 11
RCA	05
SHARP	06
SONY	07
TOSHIBA	08
ZENITH	09
HITACHI	10
SAMSUNG	12
SANYO	13
SEARS	13

TV Multi-Brand Remote Control

The VCR's remote control can control several functions on JVC remote control TVs and on the brands of remote control TVs listed below. *The default setting is JVC code 01.

1 TURN ON THE TV

Turn the power on using the TV's remote control.

2 SET TV BRAND CODE

Refer to the chart in the left column. While holding down **TV** on the VCR's remote control, press **MBR SET** and enter your TV's brand code using the **NUMBER** keys, then press **STOP**.
Follow the example shown below.
Check if the TV's power goes off as it should. If it does, try other operations (☞ step **3**).

- Once you have set the remote control to operate the TV, you don't have to repeat this step until you replace your remote control's batteries.
- PANASONIC has two codes. If the TV does not function with one code, try entering the other.

3 OPERATE TV

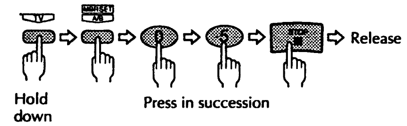
First, while holding down **TV**, press the corresponding button: **POWER, TV CH +/–, TV/VCR, TV VOL +/–, NUMBER** keys.

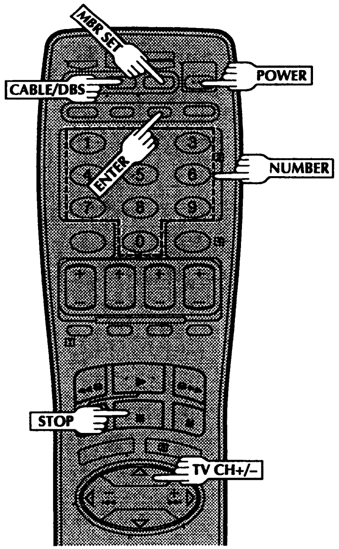
- For some brands of TV, you must press **ENTER** after having pressed the **NUMBER** keys.

NOTE:

Depending on the type of TV, there may be cases where some or all functions cannot be operated using the remote control.

(Ex.) To set remote control to RCA 05:





CABLE BOX BRAND NAME	BRAND CODE
ARCHER	01, 05, 17
CABLETENNA	01, 17
CABLEVIEW	15, 16, 17, 21, 25
CITIZEN	15, 16, 17, 21, 25
CURTIS	02
DIAMOND	01, 17
EASTERN	19
GC BRAND	15, 16, 17, 21, 25
GEMINI	15
GENERAL INSTRUMENTS	01, 04, 06, 11, 12, 15
HAMLIN	10, 18, 19, 23
JASCO	15
JERROLD	01, 04, 06, 11, 12, 15
NOVAVISION	02
OAK	07
PANASONIC	13, 14
PULSER	15, 16, 17, 21, 25
RCA	13, 14
REGAL	10, 18, 19, 23
REGENCY	19
REMBRANDT	01, 16, 17
SAMSUNG	05, 16, 24
SCIENTIFIC ATLANTA	02
SIGMA	07
SL MARX	05, 16, 17, 24, 25
SPRUCER	13, 14
STARGATE	05, 15, 16, 17, 21, 24, 25
TELEVIEW	05, 16, 24
TOCOM	01, 04, 16
UNIKA	01, 17
UNIVERSAL	16, 17, 25
VIDEOWAY	03, 09, 22
ZENITH	03, 09, 22

Cable Box Multi-Brand Remote Control

The VCR's remote control can control functions on the brands of cable boxes listed below. Some cable box brands have more than one code. If your cable box does not function with a specified code, try other codes.

1 TURN ON THE CABLE BOX

Turn the power on using the cable box's remote control.

2 ENTER CABLE BOX BRAND

While holding down **CABLE/DBS** on the VCR's remote control, press **MBR SET** and use the **NUMBER** keys to enter the cable box brand number from the chart in the left column and then press **STOP**.
Follow the example shown below.
Check if the cable box's power goes off as it should. If it does, try other operations (☞ step **3**).

- Once you have set the remote control to operate the cable box, you don't have to repeat this step until you replace the remote control's batteries.

3 OPERATE CABLE BOX

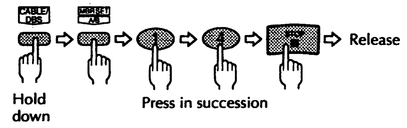
First, while holding down **CABLE/DBS**, press the corresponding button: **POWER, TV CH +/–, NUMBER** keys.

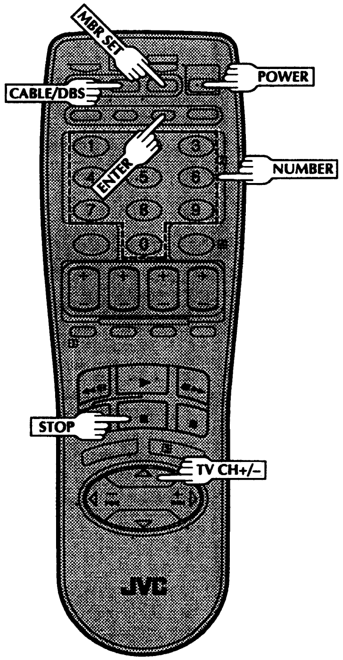
- For some brands of cable box, you must press **ENTER** after having pressed the **NUMBER** keys.
- To change the cable box's channel, press **TV CH +/–** or the **NUMBER** keys. (The **CH +/–** button can be used to change the VCR's channel only.)

NOTES:

- *Depending on the type of cable box, there may be cases where some or all functions cannot be operated using the remote control.*
- *It's not possible to set the remote control for both your cable box and a DBS receiver at the same time. You can only set the remote control to operate one of these units at a time.*

(Ex.) To set remote control to RCA 14:





DBS Receiver Multi-Brand Remote Control

The VCR's remote control can control functions on the brands of DBS (Direct Broadcast Satellite) receivers listed below.

1 TURN ON THE DBS RECEIVER

Turn the power on using the DBS receiver's remote control.

2 ENTER DBS RECEIVER BRAND

While holding down **CABLE/DBS** on the VCR's remote control, press **MBR SET** and use the **NUMBER** keys to enter the DBS receiver brand number from the chart in the left column and then press **STOP**.
Follow the example shown below.
Check if the DBS receiver's power goes off as it should. If it does, try other operations (☞ step **3**).

- Once you have set the remote control to operate the DBS receiver, you don't have to repeat this step until you replace the remote control's batteries.

3 OPERATE DBS RECEIVER

First, while holding down **CABLE/DBS**, press the corresponding button: **POWER**, **TV CH** +/–, **NUMBER** keys.

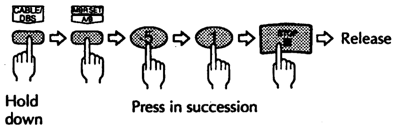
- Depending on the DBS receiver you may have to press **ENTER** after having pressed the **NUMBER** keys.
- To change the DBS receiver's channel, press **TV CH** +/– or the **NUMBER** keys. (The **CH** +/– button can be used to change the VCR's channel only.)

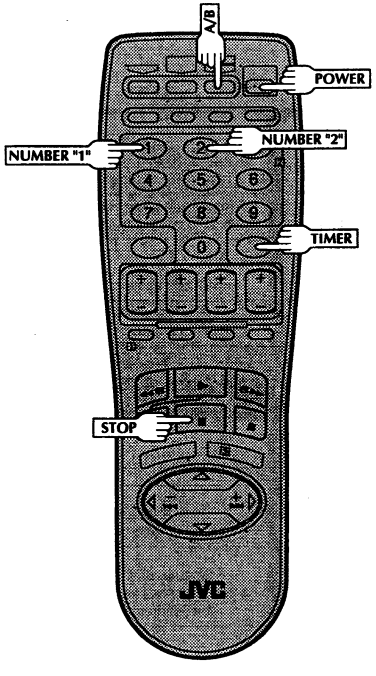
DBS BRAND NAME	BRAND CODE
JVC (DISH Network)	51
ECHOSTAR (DISH Network)	51
PRIMESTAR	50
SONY (DSS)	41
RCA (DSS)	40

NOTES:

- *Depending on the type of DBS receiver, there may be cases where some or all functions cannot be operated using the remote control.*
- *It's not possible to operate a DBS receiver that is not equipped with a remote control sensor.*
- *Though ECHOSTAR has a number of different remote codes, this remote control is applicable only to one of those codes preset at the factory.*
- *It's not possible to set the remote control for both your DBS receiver and a cable box at the same time. You can only set the remote control to operate one of these units at a time.*

(Ex.) To set remote control to JVC 51:





Child Lock

This feature allows you to prevent the operation of the VCR.

1 TURN VCR POWER ON

Press **POWER**.

2 ENGAGE CHILD LOCK

Press and hold **POWER** on the remote control until the Child Lock indicator ("—") appears on the front display panel.

- Power turns OFF and the VCR cannot be turned on from the **POWER** button on the front panel.
- To cancel Child Lock, press and hold **POWER** on the remote until the VCR turns on. During timer recording, pressing **TIMER** also cancels Child Lock.

NOTES:

- *When Child Lock is engaged, make sure to keep the remote control out of the reach of children.*
- *Timer recording of programs that were previously set can be performed while the Child Lock is engaged. The feature remains in effect after the recording is finished.*

Control Two JVC VCRs

The remote control is capable of controlling two JVC VCRs independently; one set to respond to your remote control's **A** code control signals and another set to respond to **B** code control signals. The remote control is preset to send **A** code signals because your VCR is initially set to respond to **A** code signals. You can easily modify your VCR to respond to **B** code signals.

1 UNPLUG VCR'S POWER CORD

Unplug from the AC outlet.

2 SET REMOTE CONTROL CODE

While holding down **A/B** on the remote control, press the **NUMBER** key "2" and then press **STOP**.

3 PLUG IN POWER CORD

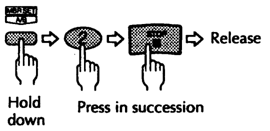
Plug back in to the AC outlet.

4 TURN VCR POWER ON

Press **POWER** on the remote.

The VCR will now respond only to B-code commands.
To set the VCR back to respond to A code signals, repeat the same procedure as shown above except pressing **NUMBER** key "1" instead of "2" in step **2**.
You can control two VCRs with the same remote control by switching the remote's code between A and B (☞ Step **2**).

(Ex.) To set remote control B code:



Before requesting service for a problem, use this chart and see if you can repair the trouble yourself. Small problems are often easily corrected, and this can save you the trouble of sending your VCR off for repair.

POWER

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. The power won't come on.	● The power cord is disconnected.	Connect the power cord.
2. The clock works, but the VCR's power won't come on.	● The TIMER mode is engaged with Auto Timer set to "OFF" (☞ pg. 37). ● The Child Lock mode is engaged.	Press **TIMER** to disengage. Press and hold **POWER** on the remote to disengage the mode (☞ pg. 45).
3. The remote control won't function.	● The batteries are discharged.	Replace the dead batteries with new ones.

TAPE TRANSPORT

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. The cassette gets stuck partway during loading, and is ejected.	● The cassette was inserted incorrectly.	Make sure the cassette's window is facing up, the rear label side is facing you and the arrow on the front of the cassette is pointing towards the VCR. Then insert the cassette.

PLAYBACK

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. The tape is running but the picture won't appear.	● If you're using the RF OUT connection (☞ pg. 6), the channel selector on the TV is set incorrectly. ● If you're using the AV connection (☞ pg. 6), the TV receiver is set to the wrong mode.	Set the channel selector to channel 3 or 4. Set the TV receiver to its AV mode.
2. Noise appears during visual search.	● This is normal.	
3. (HR-VP673U only) Breaks are noticeable in Hi-Fi soundtrack.	● Automatic tracking is engaged.	Disengage Auto Tracking and adjust the tracking manually (☞ pg. 19).
4. The playback picture is blurred or interrupted, even though TV broadcasts are clear.	● The video heads may be dirty.	The heads must be cleaned. Consult your JVC dealer.
5. (HR-VP673U only) The Hi-Fi soundtrack cannot be heard.	● The AUDIO MONITOR option was set incorrectly.	Set AUDIO MONITOR to "HI-FI" (☞ pg. 24).

RECORDING

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Recording won't start.	● There's no cassette loaded. ● The loaded cassette has had its record safety tab removed.	Insert a cassette. Remove the cassette and cover the hole with adhesive tape, or load a cassette on which the record safety tab is intact.
2. TV broadcasts won't record properly.	● The VCR has been set to its AUX mode by mistake.	Set the VCR to the appropriate channel.
3. Tape-to-tape editing won't work.	● The VCRs or the camcorder and the VCR have been incorrectly connected. ● The power to one or more of the units has not been turned on. ● The recorder's input mode has been set incorrectly.	Refer to the directions and the illustration under "Edit To Another VCR" (☞ pg. 39) or "Edit From A Camcorder Or Another VCR" (☞ pg. 40) and properly connect the units. Make sure the power to all units is on. Select the recorder's appropriate input mode.

TIMER RECORDING

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. Timer recording won't work.	● The clock and/or the timer have been set incorrectly. ● The timer is not engaged. ● The VCR has not been set up properly.	Set the clock and/or timer correctly. Press **TIMER** and check to make sure that ◷ appears on the front display panel. Re-perform the set-up procedures. Make sure you have compensated for Guide Channel and VCR or cable box channel number mismatches (☞ pg. 32).
2. Timer programming won't work.	● Timer recording is in progress.	Timer programming can't be performed when timer recording is in progress. Wait until it finishes.
3. ◷ and 📼 on the front display panel won't stop blinking.	● The timer is engaged but there's no cassette loaded.	Load a cassette with the record safety tab intact, or with the hole covered with adhesive tape.
4. The cassette is automatically ejected, and ◷ and 📼 on the front display panel won't stop blinking.	● The loaded cassette has had its record safety tab removed.	Remove the cassette and cover its hole with adhesive tape, or replace it with a cassette on which the safety tab is intact.
5. ◷ blinks for 10 seconds and the timer mode is disengaged.	● **TIMER** has been pressed when there are no programs in memory, or the timer record program information has not been programmed correctly.	Check the programmed data and re-program as necessary, then press **TIMER** again.
6. The cassette is automatically ejected, the power shuts off and ◷ and 📼 won't stop blinking.	● The end of tape was reached during timer recording.	The program may not have been recorded in its entirety. Next time make sure you have enough time on the tape to record the entire program.
7. We moved, and now VCR Plus+ doesn't work properly.	● The receivable stations in the new area are received on different channels than those in the previous area.	Re-perform the VCR Plus+ setup procedure (☞ pg. 32).
8. "PROGRAM FULL" is displayed on the screen.	● All 8 programs of the VCR's timer memory are used.	Wait until a space in memory clears, or cancel unnecessary program information (☞ pg. 36).

OTHER PROBLEMS

SYMPTOM	POSSIBLE CAUSE	CORRECTIVE ACTION
1. When scanning channels, some of them are skipped over.	● Those channels have been preset to be skipped.	If you need the skipped channels, restore them (☞ pg. 15).
2. The channel can't be changed.	● Recording is in progress.	Press **PAUSE** to pause the recording, change channels, then press **PLAY** to resume recording.
3. The remote control won't operate my TV or cable box or DBS receiver.	● The remote control brand setting is incorrect.	Re-set the remote control to the correct brand (☞ pg. 42, 43 or 44).
4. Even though Auto or Semi-Auto clock setting has been selected, the clock is incorrect.	● The clock setting data received from the Host Channel is incorrect.	Select a different Host Channel during the Semi-Auto setting procedure (☞ pg. 12), or perform the Manual setting procedure (☞ pg. 13).

ATTENTION:
This VCR contains microcomputers. External electronic noise or interference can cause microcomputer to malfunction. If the VCR does not operate correctly switch its power off and unplug the power cord from the AC supply. Wait for a while and then plug the power back in. Eject and check the condition of the cassette. If everything appears normal resume operating the VCR as usual.

PLAYBACK

Q. What happens if the end of the tape is reached during playback or search?
A. The tape is automatically rewound to the beginning.

Q. Can the VCR indefinitely remain in the still mode?
A. No. It stops automatically after 5 minutes to protect the heads.

Q. During search, slow, still and frame-by-frame playback, I can't hear any audio. What's the problem?
A. This is normal.

Q. During search, still and frame-by-frame playback, the picture is intermittent. What's the cause?
A. Picture loss occurs when these types of playback are attempted with a tape recorded in LP mode. Pressing **PLAY** to return to normal playback will restore the picture.

Q. When returning from multi-speed search to normal playback, the picture is disturbed. Should I be concerned about this?
A. No, it is normal.

Q. Noise bars appear during multi-speed search. What's the problem?
A. This is normal.

Q. When playing back programs that have been timer-recorded with consecutive times (such one program from 8:00 to 9:00 and another one from 9:00 to 10:00), the picture and sound become momentarily distorted at the point where the first program ends and the second program begins. Is this a malfunction?
A. No. This is normal.

Q. Other than preventing further recording, what effect does removing the safety tab have?
A. It disables marking of index codes.

Q. Sometimes, during Index Search, the VCR can't find the program I want to see. Why not?
A. There may be index codes too close together.

Q. During playback, on-screen operational indicators sometimes jitter. Why does this happen?
A. If the condition of the tape being played back is not good, jittering of the video (including on-screen indicators) may occur.

RECORDING

Q. When I pause and then resume a recording, the end of the recording before the pause is overlapped by the new recording. Why does this happen?
A. This is normal. It reduces distortion at the pause and resume points.

Q. Can the VCR indefinitely remain in the Record-Pause mode?
A. No. The VCR automatically goes to its Stop mode after 5 minutes to protect the heads. When paused during Instant Timer Recording (ITR), the VCR shuts off automatically after 5 minutes.

Q. What happens if the tape runs out during recording?
A. The VCR automatically rewinds it to the beginning.

TIMER RECORDING

Q. REC and ⊕ remain lit on the front display panel. Is there a problem?
A. No. This is a normal condition for a timer recording in progress.

Q. Can I program the timer while I'm watching a tape or a TV broadcast?
A. Yes, but while you are setting the timer you won't see the tape's or broadcast program's picture as it is replaced by the on-screen menu. The audio from the tape or broadcast program will be present during the setting of the timer.

List Of Terms

This guide serves as a quick way to locate frequently used terms and on-screen display names.

A
A/B Code 45
Active Video Calibration 26
Add Channel 15
Audio Monitor 24
Auto Channel Setting 14
Auto Daylight Saving Time 12
Auto SP→EP Timer 37
Auto Timer 37
Automatic Tracking 19
Aux Input 39
AV Connection 6

B
Band 14

C
Cancel Program 36
Cassette Adapter 16
Check Program 36
Child Lock 45
Connection to TV 6
Contents 5
Counter Reset 22

D
Delete Channel 15

E
Editing 39
Express Timer Programming 34
Express Timer Recording 34

F
Frame-by-Frame Playback 18

G
Guide Channel Setting 33

H
Host Channel Selection 12

I
Index Search 19
Insert Cassette 16
Instant ReView 19
ITR (Instant Timer Recording) 37

L
Language Selection 10

M
Main Menu 10
Manual Channel Setting 15
Manual Clock Setting 13
Manual Tracking 19
MBR (Multi-Brand Remote) Code Setting 42
Movie Advance 25

N
Next-Function Memory 22

O
On-Screen Display 23

P
PBS Channel 8
Picture Control 20
Playback 16
Plug & Play 8

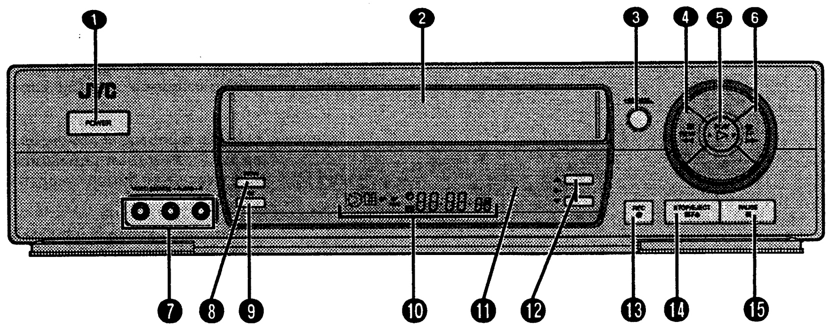
R
Record Safety Tab 17
Recording 17
Repeat Playback 22
Reverse Motion Playback 18
Reverse Slow Motion Playback 18
RF Connection 6

S
SAP (Second Audio Program) 29
Second Audio 29
Semi-Auto Clock Setting 12
Skip Search 19
Slow Motion Playback 18
Specifications 53
SQPB (S-VHS Quasi Play Back) 16
Still Picture Playback 18
Superimpose 23

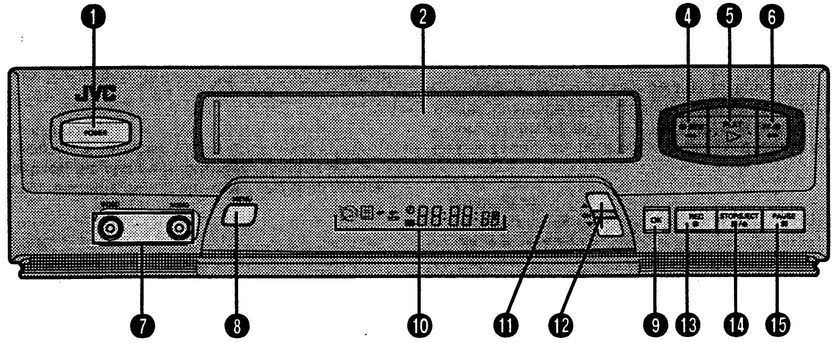
T
Tape Position Indicator 22
Tape Speed Setting 17
Time Zone Selection 13
Tuner Setting 14

V
Variable-Speed Search 18
VCR Plus+ Timer Programming 30
VCR Plus+ Timer Recording 30
Video Stabilizer 21

FRONT VIEW [VP673U]

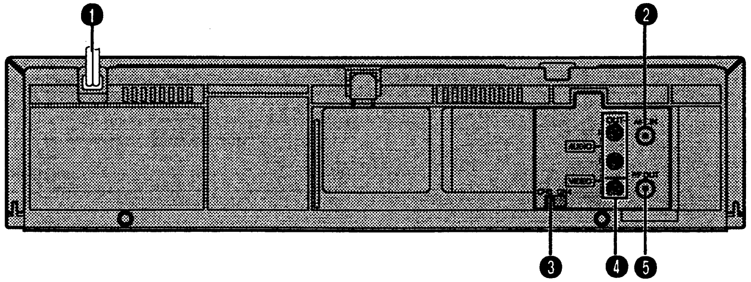


FRONT VIEW [VP473U]

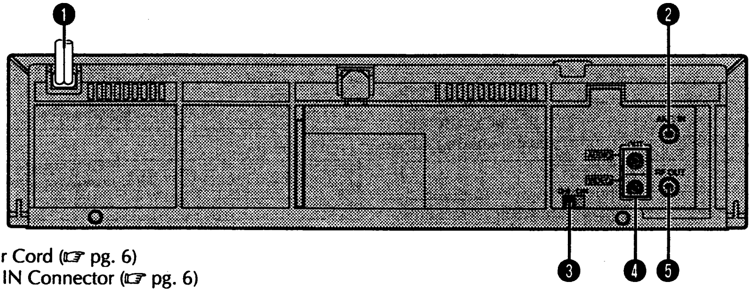


① Power On/Off Button (☞ pg. 10)
② Cassette Loading Slot
③ Instant ReView [RE-VIEW] Button (☞ pg. 19)
④ Rewind [REW] Button (☞ pg. 16)
⑤ PLAY Button (☞ pg. 16)
⑥ Fast Forward [FF] Button (☞ pg. 16)
⑦ VIDEO/AUDIO Input Connectors (☞ pg. 40)
⑧ MENU Button (☞ pg. 10)
⑨ OK Button (☞ pg. 10)
⑩ Front Display Panel (☞ pg. 51)
⑪ Remote Control Sensor
⑫ Channel [CH] ▲▼ Button (☞ pg. 17)
⑬ Record [REC] Button (☞ pg. 17)
⑭ STOP/EJECT Button (☞ pg. 16)
⑮ PAUSE Button (☞ pg. 18)

REAR VIEW [VP673U]

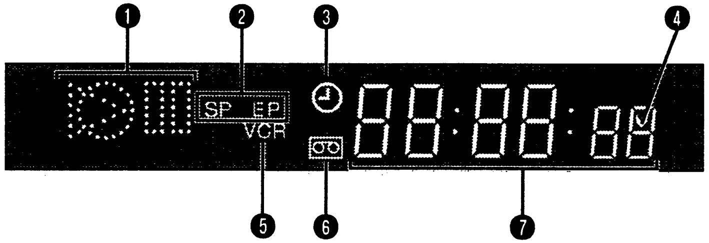


REAR VIEW [VP473U]



① Power Cord (☞ pg. 6)
② ANT. IN Connector (☞ pg. 6)
③ Channel 3/4 Switch (☞ pg. 6)
④ VIDEO/AUDIO Output Connectors (☞ pg. 39)
⑤ RF OUT Connector (☞ pg. 6)

FRONT DISPLAY PANEL

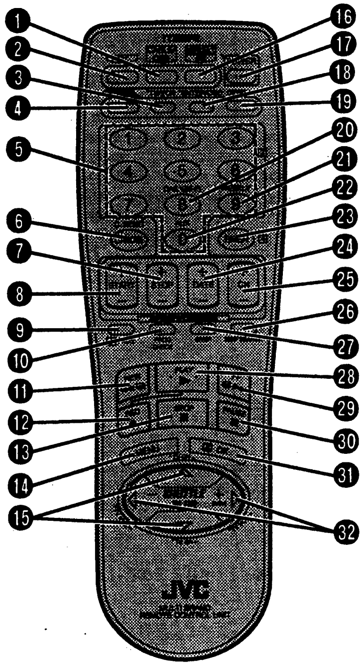


① Symbolic Mode Indicators

PLAY: FF/REW VARIABLE SEARCH:	▷	STILL: SLOW:	▷▥
		RECORD:	○
		RECORD PAUSE:	○▥

② Tape Speed Indicators (☞ pg. 17)
③ Timer Mode Indicator (☞ pg. 31, 35)
④ Child Lock Indicator (–) (☞ pg. 45)
⑤ VCR Mode Indicator (☞ pg. 28)
⑥ "Cassette Loaded" Mark
⑦ Channel Display ["F-1" for AUX mode]
Counter Display (☞ pg. 8)
Clock Display (☞ pg. 8)

REMOTE CONTROL



① CABLE/DBS Button (☞ pg. 43, 44)
② TV Button (☞ pg. 42)
③ TV/VCR Button (☞ pg. 28)
④ Instant REVIEW Button (☞ pg. 19)
⑤ NUMBER Buttons (☞ pg. 17, 30)
⑥ CANCEL Button (☞ pg. 36)
Counter [C.] RESET Button (☞ pg. 22)
⑦ STOP +/– Button (☞ pg. 34)
⑧ START +/– Button (☞ pg. 34)
⑨ PROG. Button (☞ pg. 30, 34)
⑩ PROG. CHECK Button (☞ pg. 36)
⑪ Rewind [REW] Button (☞ pg. 16)
⑫ Record [REC] Button (☞ pg. 17)
⑬ STOP Button (☞ pg. 16)
⑭ MENU Button (☞ pg. 10)
⑮ SHUTTLE PLUS ∆∇ Button (☞ pg. 10)
TV Channel [CH] +/– Button (☞ pg. 42, 43 or 44)
⑯ MBR SET Button (☞ pg. 42, 43 or 44)
A/B Code Button (☞ pg. 45)
⑰ POWER On/Off Button (☞ pg. 10)
⑱ ENTER Button (☞ pg. 17)
On-Screen Display [OSD] Button (☞ pg. 23)
⑲ DISPLAY Button (☞ pg. 22)
⑳ DAILY Timer Recording Button (☞ pg. 31, 35)
㉑ WEEKLY Timer Recording Button (☞ pg. 31, 35)
㉒ "AUX" Mode Select Button (☞ pg. 41)
㉓ TIMER Button (☞ pg. 31, 35)
㉔ DATE +/– Button (☞ pg. 34)
㉕ Channel [CH] +/– Button (☞ pg. 17, 34)
㉖ SKIP SEARCH Button (☞ pg. 19, 25)
㉗ Recording Speed [SP/EP] Button (☞ pg. 17)
㉘ PLAY Button (☞ pg. 16)
㉙ Fast-Forward [FF] Button (☞ pg. 16)
㉚ PAUSE Button (☞ pg. 18)
㉛ OK Button (☞ pg. 10)
㉜ SHUTTLE PLUS |◀◀ ▶▶| (◁ ▷) Button
(☞ pg. 18, 19)
TV Volume [VOL.] +/– Button (☞ pg. 42)

Buttons with a small dot on the left side of the name can also be used to operate your TV while holding down the **TV** button. ☞ pg. 42

How To Use

The remote control can operate most of your VCR's functions, as well as basic functions of TV sets, Cable Boxes and DBS Receivers.

- Point the remote control toward the sensor window.
- The maximum operating distance of the remote control is about 8 m.

NOTES:

- *When inserting the batteries, be sure to insert in the correct directions as indicated under the battery cover.*
- *If the remote control doesn't work properly, remove its batteries, wait a short time, replace the batteries and then try again.*

GENERAL

Power requirement	: AC 120 V∿ , 60 Hz
Power consumption	
Power on	: **HR-VP673U** 19 W **HR-VP473U** 17 W
Power off	: 2.5 W
Temperature	
Operating	: 5°C to 40°C (41°F to 104°F)
Storage	: –20°C to 60°C (–4°F to140°F)
Operating position	: Horizontal only
Dimensions (W x H x D)	: **HR-VP673U** 400 x 94 x 275 mm (15-3/4" x 3-3/4" x 10-7/8") **HR-VP473U** 360 x 94 x 273 mm (14-3/16" x 3-3/4" x 10-3/4")
Weight	: **HR-VP673U** 3.2 kg (7.1 lbs) **HR-VP473U** 3.0 kg (6.6 lbs)
Format	: VHS NTSC standard
Maximum recording time	
SP	: 210 min. with ST-210 video cassette
EP	: 630 min. with ST-210 video cassette

VIDEO/AUDIO

Signal system	: NTSC-type color signal and EIA monochrome signal, 525 lines/60 fields
Recording/ Playback system	: DA-4 (Double Azimuth) head helical scan system
Signal-to-noise ratio	: 45 dB
Horizontal resolution	: 240 lines
Frequency range	
Normal audio	: 70 Hz to 10,000 Hz
Hi-Fi audio (HR-VP673U only)	: 20 Hz to 20,000 Hz
Input/Output	: RCA connectors (IN x 1, OUT x 1)

TUNER

Tuning system	: Frequency-synthesized tuner
Channel coverage	
VHF	: Channels 2–13
UHF	: Channels 14–69
CATV	: 113 Channels
RF output	: Channel 3 or 4 (switchable; preset to Channel 3 when shipped) 75 ohms, unbalanced

TIMER

Clock reference	: Quartz
Program capacity	: 1-year programmable timer/ 8 programs
Memory backup time	: Approx. 10 min.

ACCESSORIES

Provided accessories	: RF cable (F-type), Infrared remote control unit, "AA" battery x 2

Specifications shown are for SP mode unless otherwise specified. E. & O.E. Design and specifications subject to change without notice.

HOW TO LOCATE YOUR JVC SERVICE CENTER

TOLL FREE: 1-800-252-5722
http://www.jvcservice.com

Dear customer:

In order to receive the most satisfaction from your purchase, read the instruction booklet before operating the unit. In the event that repair is necessary, or for the address nearest your location, please refer to the factory service center list below or within the Continental United States, call 1-800-252-5722 for your authorized servicer. Remember to retain your Bill of Sale for Warranty Service.

— JVC

JVC SERVICE & ENGINEERING COMPANY OF AMERICA
DIVISION OF US JVC CORP.

FACTORY SERVICE CENTER LOCATIONS

107 Little Falls Road
Fairfield, NJ 07004-2105
(973) 808-9279

1500 Lakes Parkway
Lawrenceville, GA 30243-5857
(770) 339-2522

705 Enterprise Street
Aurora, IL 60504-8135
(630) 851-7855

5665 Corporate Avenue
Cypress, CA 90630-4727
(714) 229-8011

10700 Hammerly Boulevard, Suite 110
Houston, TX 77043-2310
(713) 935-9331

2969 Mapunapuna Place, Suite 101
Honolulu, HI 96819-2000
(808) 833-5828

230 Eliot Street
Ashland, MA 01721-2377
(508) 881-5923

8192 W State Road 84
Davie, FL 33324-4611
(954) 472-1960

890 Dubuque Avenue
South San Francisco, CA 94080-1804
(650) 871-2666

Sophisticated electronic products may require occasional service. Just as quality is a keyword in the engineering and production of the wide array of JVC products, service is the key to maintaining the high level performance for which JVC is world famous. The JVC service and engineering organization stands behind our products.

NATIONAL HEADQUARTERS
JVC SERVICE & ENGINEERING COMPANY OF AMERICA
DIVISION OF US JVC CORP.
107 Little Falls Road
Fairfield, NJ 07004-2105

If you ship the product...

Pack your JVC unit in the original carton or one of equivalent size and strength. Enclose, with the unit, a letter stating the problem or symptom that exists and also a copy of the receipt or bill of sale you received when you purchased your JVC unit. Print your home return address on the outside and the inside of the carton. Send to the appropriate JVC Factory Service Center as listed above.

ACCESSORIES

To purchase accessories for your JVC product, you may contact your local JVC Dealer.
Or from the 48 Continental United States call toll free:
1-800-882-2345.

Don't service it yourself.

CAUTION

To prevent electrical shock, do not open the cabinet. No user serviceable parts inside.
Refer servicing to qualified service personnel.

LIMITED WARRANTY

CONSUMER VIDEO 1-90

JVC COMPANY OF AMERICA warrants this product and all parts thereof, except as set forth below ONLY TO THE ORIGINAL PURCHASER AT RETAIL to be FREE FROM DEFECTIVE MATERIALS AND WORKMANSHIP from the date of original retail purchase for the period as shown below. ("The Warranty Period")

PARTS	LABOR
1 YR	90 DAYS

THIS LIMITED WARRANTY IS VALID ONLY IN THE FIFTY (50) UNITED STATES, THE DISTRICT OF COLUMBIA AND IN COMMONWEALTH OF PUERTO RICO.

WHAT WE WILL DO:
If this product is found to be defective, JVC will repair or replace defective parts at no charge to the original owner. Such repair and replacement services shall be rendered by JVC during normal business hours at JVC authorized service centers. Parts used for replacement are warranted only for the remainder of the Warranty Period. All products and parts thereof may be brought to a JVC authorized service center on a carry-in basis except for Television sets having a screen size 25 inches and above which are covered on an in-home basis.

WHAT YOU MUST DO FOR WARRANTY SERVICE:
Return your product to a JVC authorized service center with a copy of your bill of sale. For your nearest JVC authorized service center, please call toll free: (800) 252-5722.

If service is not available locally, box the product carefully, preferably in the original carton, and ship, insured, with a copy of your bill of sale plus a letter of explanation of the problem to the nearest JVC Factory Service Center, the name and location of which will be given to you by the toll-free number.

If you have any questions concerning your JVC Product, please contact our Customer Relations Department.

WHAT IS NOT COVERED:
This limited warranty provided by JVC does not cover:

1. Products which have been subject to abuse, accident, alteration, modification, tampering, negligence, misuse, faulty installation, lack of reasonable care, or if repaired or serviced by anyone other than a service facility authorized by JVC to render such service, or if affixed to any attachment not provided with the products, or if the model or serial number has been altered, tampered with, defaced or removed;
2. Initial installation and installation and removal for repair;
3. Operational adjustments covered in the Owner's Manual, normal maintenance, video and audio head cleaning;
4. Damage that occurs in shipment, due to act of God, and cosmetic damage;
5. Signal reception problems and failures due to line power surge;
6. Video Pick-up Tubes/CCD Image Sensor, Cartridge, Stylus (Needle) are covered for 90 days from the date of purchase;
7. Accessories;
8. Batteries (except that Rechargeable Batteries are covered for 90 days from the date of purchase); from the date of purchase);

There are no other express warranties except as listed above.

THE DURATION OF ANY IMPLIED WARRANTIES INCLUDING THE IMPLIED WARRANTY OF MERCHANTABILITY, IS LIMITED TO THE DURATION OF THE EXPRESS WARRANTY HEREIN.

JVC SHALL NOT BE LIABLE FOR THE LOSS OF USE OF THE PRODUCT, INCONVENIENCE, LOSS OR ANY OTHER DAMAGES, WHETHER DIRECT, INCIDENTAL OR CONSEQUENTIAL (INCLUDING, WITHOUT LIMITATION, DAMAGE TO TAPES, RECORDS OR DISCS) RESULTING FROM THE USE OF THIS PRODUCT, OR ARISING OUT OF ANY BREACH OF THIS WARRANTY. ALL EXPRESS AND IMPLIED WARRANTIES, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE, ARE LIMITED TO THE WARRANTY PERIOD SET FORTH ABOVE.

Some states do not allow the exclusion of incidental or consequential damages or limitations on how long an implied warranty lasts, so these limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

JVC COMPANY OF AMERICA
DIVISION OF US JVC CORP.

1700 Valley Road
Wayne, New Jersey 07470

REFURBISHED PRODUCTS CARRY A SEPARATE WARRANTY, THIS WARRANTY DOES NOT APPLY. FOR DETAILS OF REFURBISHED PRODUCT WARRANTY, PLEASE REFER TO THE REFURBISHED PRODUCT WARRANTY INFORMATION PACKAGED WITH EACH REFURBISHED PRODUCT.

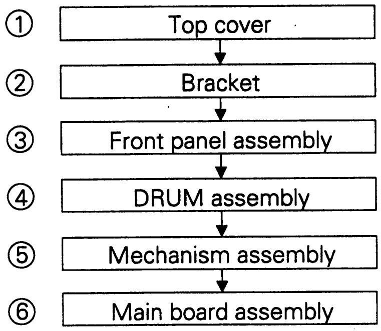
For customer use:
Enter below the Model No. and Serial No. which is located either on the rear, bottom or side of the cabinet. Retain this information for future reference.

Model No.: ____________________
Serial No.: ____________________
Purchase date: ____________________
Name of dealer: ____________________

SECTION 1
DISASSEMBLY

1.1 DISASSEMBLY FLOW CHART

This flowchart lists the disassembling steps for the cabinet parts and P.C. boards in order to gain access to item(s) to be serviced. When reassembling, perform the step(s) in reverse order. Bend, route and dress the flat cables as they were originally laid.



1.2 HOW TO READ THE DISASSEMBLY AND ASSEMBLY

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	3(S1)	
②	BRACKET	D2	2(S2)	
③	FRONT PANEL ASSEMBLY	D3	7(L1)	<NOTE 1> <NOTE 2>
④	DRUM ASSEMBLY	D4	3(S3), WR1, WR2, *CN1	<NOTE 3>
⑤	MECHANISM ASSEMBLY	D5	2(S4),2(S5),2(L2) WR3, *CN2001	<NOTE 4>
⑥	MAIN BOARD ASSEMBLY	D6	(S6), 3(L3)	

(1) (2) (3) (4) (5)

(1) Order of steps in Procedure
When reassembling, perform the step(s) in the reverse order. These numbers are also used as the identification (location) NO. of parts Figures.
(2) Part name to be removed or installed.
(3) Fig.No. showing procedure or part location
(4) Indentification of part to be removed,unhooked,unlocked, released,unpluged,unclamped or unsoldered. P = Spring, W = Washer, S = Screw, L = Locking tab, * = Unhook,unlock, release,unplug or unsolder.
(5) Adjustment information for installation

1.3 DISASSEMBLY/ASSEMBLY METHOD

STEP /LOC NO.	PART NAME	FIG. NO.	POINT	NOTE
①	TOP COVER	D1	3(S1)	
②	BRACKET	D2	2(S2)	
③	FRONT PANEL ASSEMBLY	D3	7(L1)	<NOTE 1> <NOTE 2>
④	DRUM ASSEMBLY	D4	3(S3), WR1, WR2, *CN1	<NOTE 3>
⑤	MECHANISM ASSEMBLY	D5	2(S4),2(S5),2(L2) WR3, *CN2001	<NOTE 4>
⑥	MAIN BOARD ASSEMBLY	D6	(S6), 3(L3)	

<NOTE1>
When reattaching the Front panel assembly, make sure that the door opener ⓐ of the Cassette holder assembly is lowered in position prior to the reinstallation.

<NOTE2>
When reattaching the Front panel assembly, pay careful attention to the switch lever not to make it touch the switch knob ⓑ of the Main board assembly from the side.
(If the switch knob of the Main board assembly is damaged, cassette loading is impossible.)

<NOTE3>
When inserting the flat wire into the connector, be careful not to mistake the positioning of its electrodes.

<NOTE4>
- When it is required to remove the screws (S4) retaining the Mechanism assembly, please refer to the "Procedures for Lowering the Cassette holder assembly". (See on pages 1-3.)
- When removing the Mechanism assembly only, unhook the two spacers connecting it with the Main board assembly with pliers from the back side of the Main board assembly first, and then remove the Mechanism assembly.
- When reattaching the Mechanism assembly to the Main board assembly, take care not to damage the sensors on the Main board. (D3001: LED, Q3001: Start sensor, Q3002: End sensor)

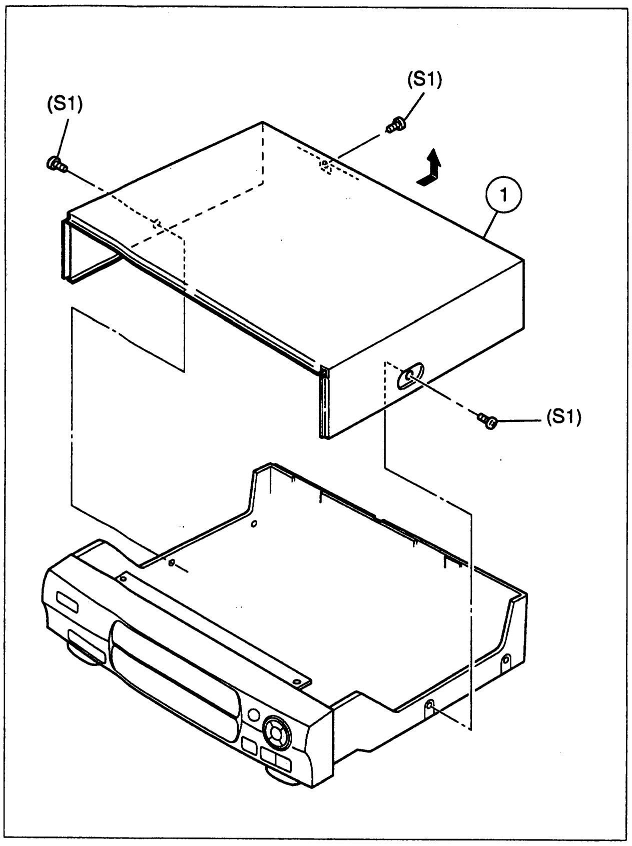


Fig. D1

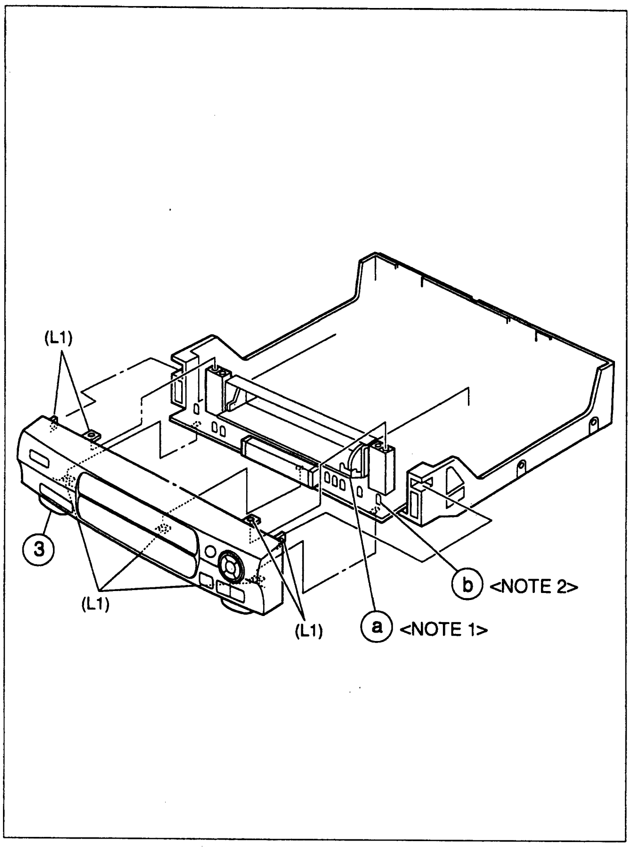


Fig. D3

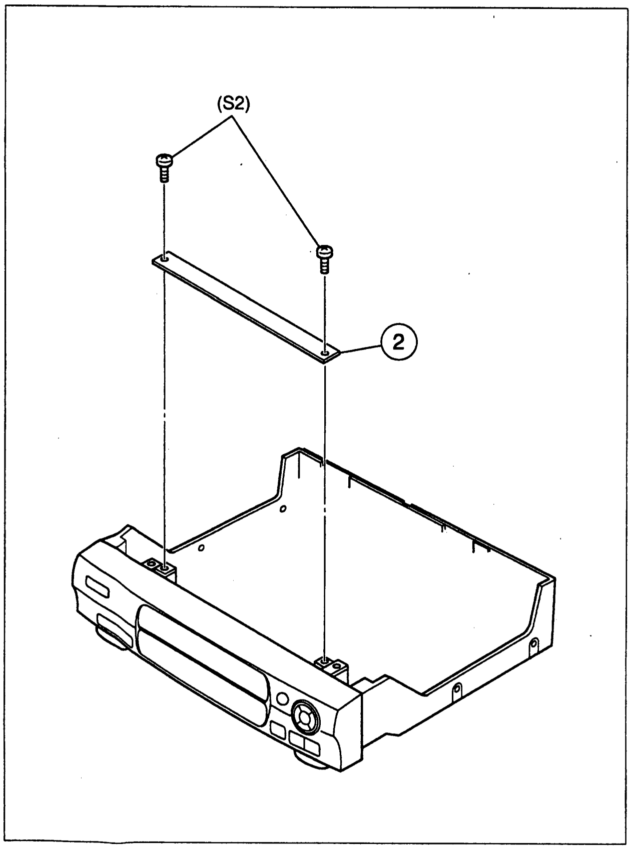


Fig. D2

NOTE : When installing the DRUM assembly, secure the screws (S3) in the order of A, B, C.

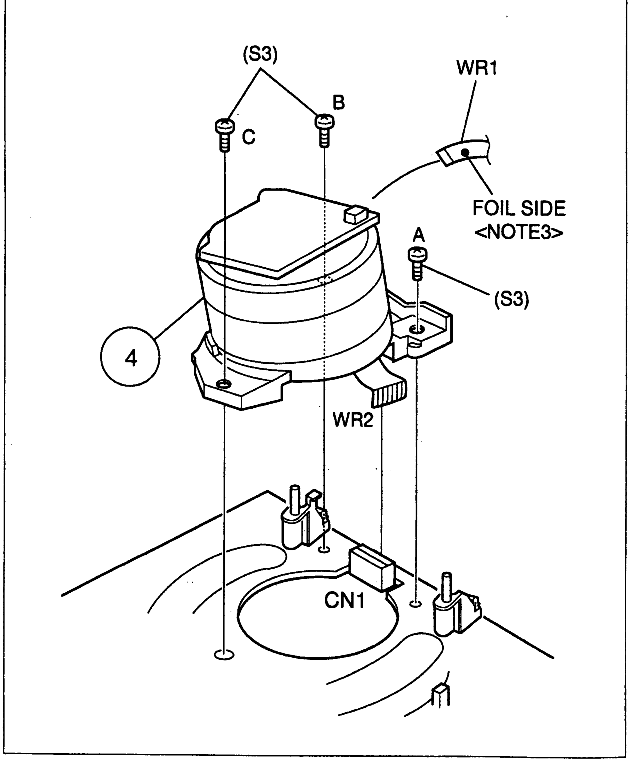

(S3)
B
C
WR1
FOIL SIDE
<NOTE3>
A
(S3)
4
WR2
CN1

Fig. D4

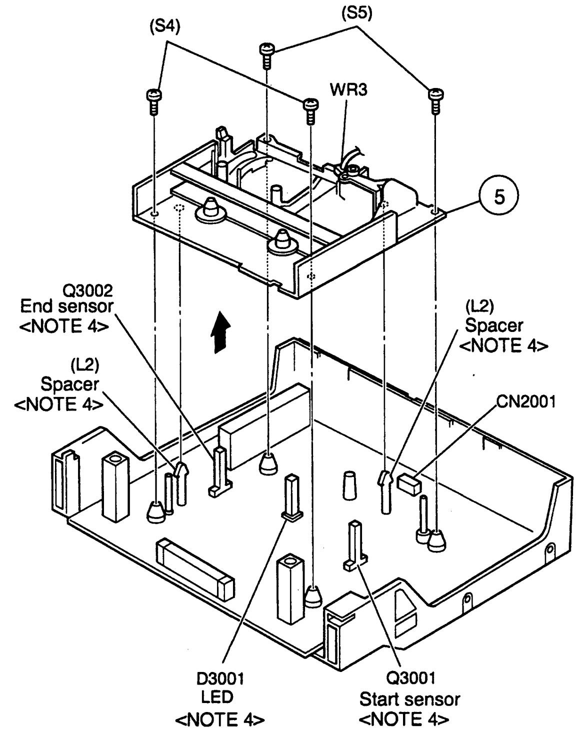

(S4)
(S5)
WR3
5
Q3002
End sensor
<NOTE 4>
(L2)
Spacer
<NOTE 4>
(L2)
Spacer
<NOTE 4>
CN2001
D3001
LED
<NOTE 4>
Q3001
Start sensor
<NOTE 4>

Fig. D5

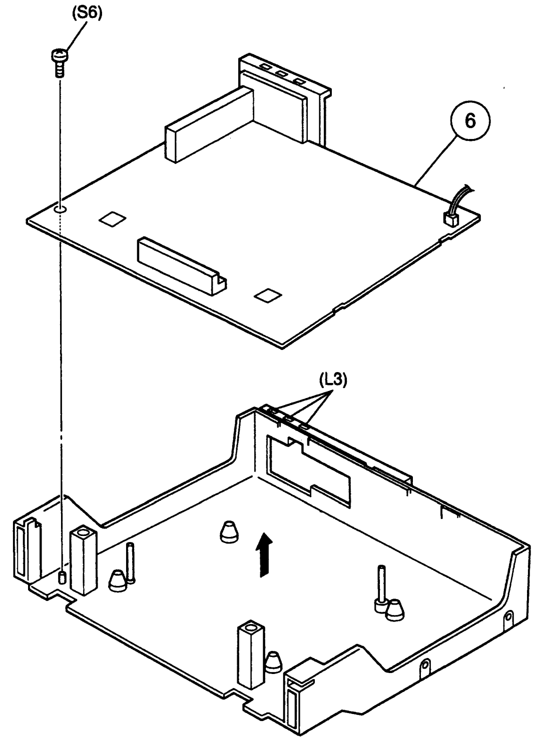


Fig. D6

Procedures for Lowering the Cassette holder assembly

As the mechanism of this unit is integrated with the Housing assembly, the holder must be lowered and the two bolts unscrewed when removing the Mechanism assembly.

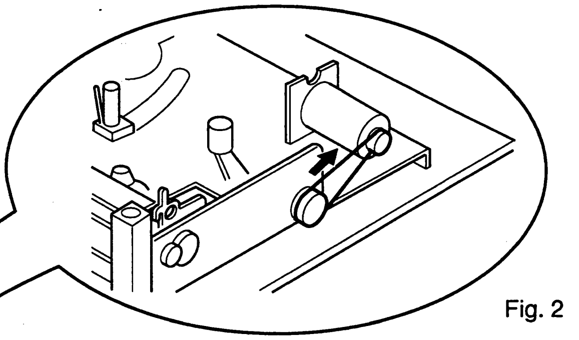


Fig. 2

Turn the loading motor pulley in the direction as indicated by Fig.2. As Ⓐand Ⓑ levers are lodged twice, push the levers in the direction as indicated by Fig.3 to release them. When pushing the levers, do it in the order of Ⓐ,Ⓑ,Ⓑ,Ⓐ. When the holder has been lowered, turn the pulley until the cassette holder is securely in place without allowing any up/down movement.

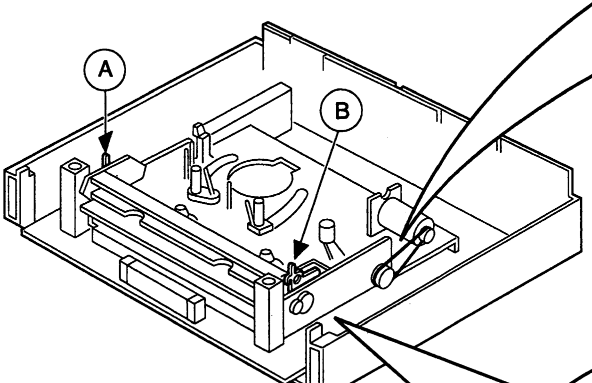


Fig. 1

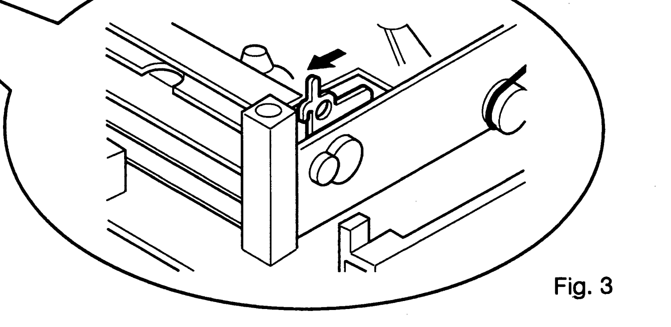


Fig. 3

1.4 SERVICE POSITION

In order to facilitate diagnosis and the repair of the Mechanism assembly, this unit is constructed so as to allow the Mechanism and the Main board assemblies to be removed together from the Chassis assembly.

1.4.1 How to take out the Mechanism and Main board assemblies

(1) Remove the Top cover, Bracket and Front panel assembly. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD. Take care not to pull the drum wire (Fig.D4) from CN1.)

(2) Lower the cassette holder, and make the preparations required in order to remove the screws from the Mechanism assembly. (Refer to the "Procedures for Lowering the Cassette holder assembly" on pages 1-3 of 1.3 DISASSEMBLY/ASSEMBLY METHOD.)

(3) Take out 2 screws Ⓐ, 2 screws Ⓑ and 1 screw Ⓒ as shown in Fig. 1-4-1.

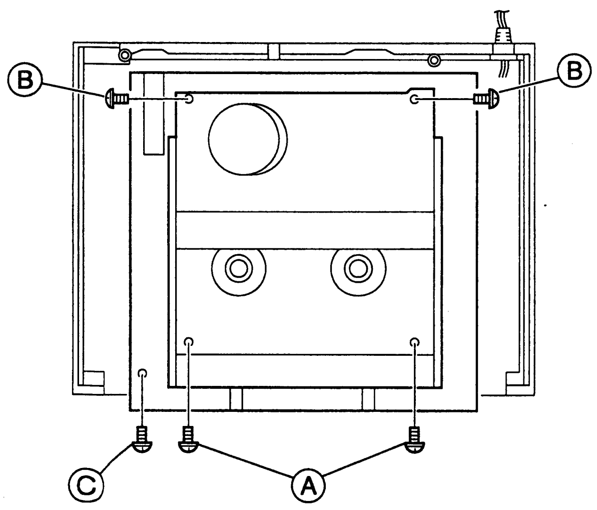


Fig. 1-4-1

(4) Remove the Main board and Mechanism assemblies together while holding the edge of the Main board. At this stage be careful of the power cord and prongs of the jacks on the back side. (See Fig. 1-4-2.)

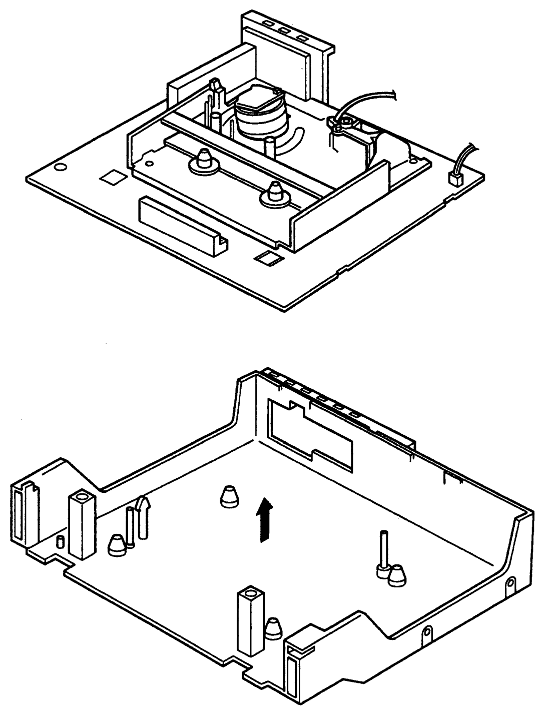


Fig. 1-4-2

(5) Connect the power cord to the wall socket, and lift the cassette holder.
(Before turning on the power make sure that there is nothing which may produce a short circuit, such as faulty soldering.)

(6) When performing a diagnosis or repair of the Main board assembly with a cassette tape in place, turn on the power, insert a cassette tape, and turn over the Main board and Mechanism assemblies together.

NOTES:

- *When carrying out diagnosis and repair of the Main board assembly in the service position, be sure to ground both the Main board and the Mechanism assemblies.*

  If they are improperly grounded, there may be noise on the playback picture or the FDP counter display may move even when the mechanism is kept in an inoperative status.

- *When performing diagnostics of the tape playback or recording condition in the "SERVICE POSITION", enter the desired mode before turning the set upside down, and do not change the mode during diagnostics while the set is placed upside down. If you want to switch the mode, turn the set to the normal position.*

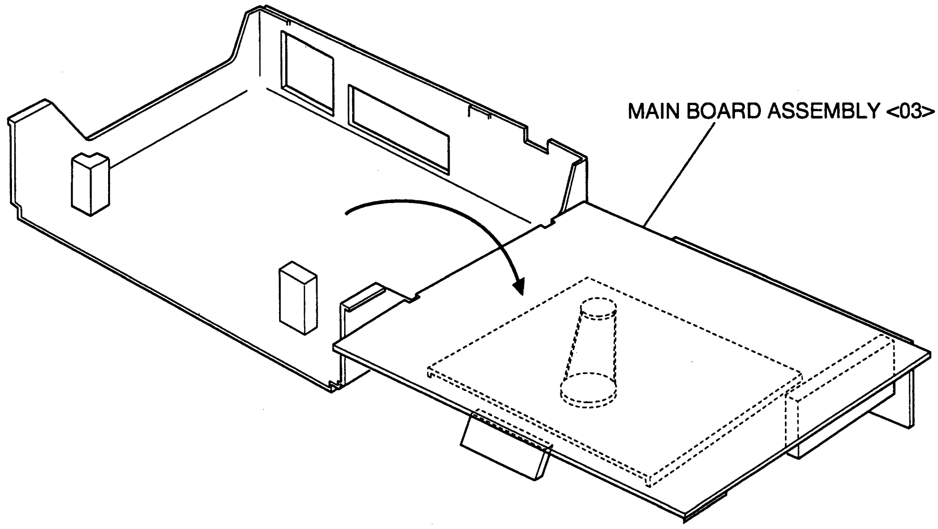

MAIN BOARD ASSEMBLY <03>

Fig. 1-4-3

1.5 MECHANISM SERVICE MODE

This model has a unique function to enter the mechanism into every operation mode without loading of any cassette tape. This function is called the "MECHANISM SERVICE MODE".

1.5.1 How to set the "MECHANISM SERVICE MODE"

(1) Disconnect VCR from AC.
(2) Connect TPGND and TP7001(TEST) on the Main board assembly with a jump wire.
(3) Connect VCR to AC.
(4) Press the POWER button.
(5) With lock levers ⒶⒷ on the left and right of the Cassette holder assembly pulled toward the front, slide the holder in the same direction as the cassette insertion direction. (For the positions of lock levers ⒶⒷ, refer to the "Procedures for Lowering the Cassette holder assembly" on pages 1-3 of 1.3 DISASSEMBLY/ASSEMBLY METHOD.)
(6) The cassette holder lowers and, when the loading has completed, the mechanism enters the desired mode.

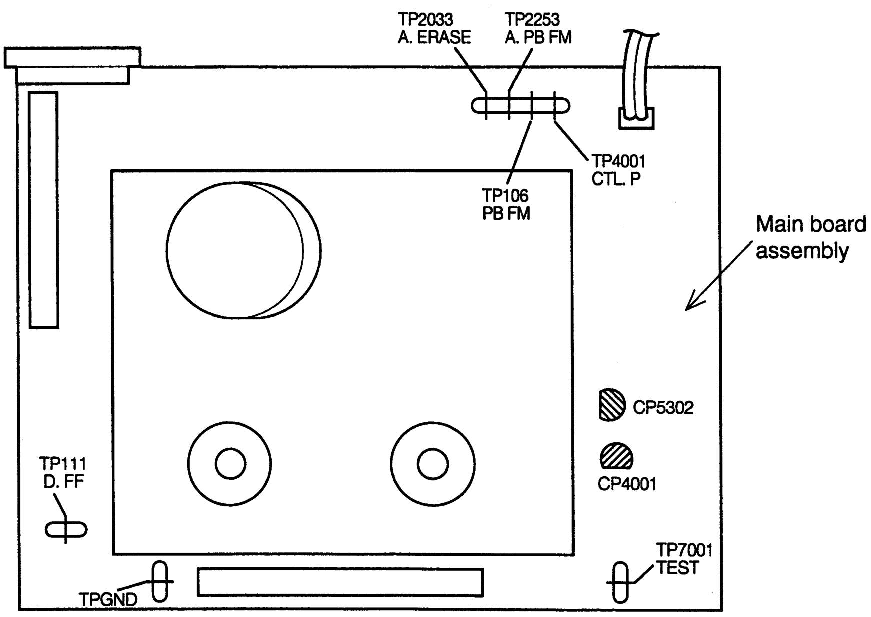

TP2033
A. ERASE
TP2253
A. PB FM
TP4001
CTL. P
TP106
PB FM
Main board assembly
CP5302
CP4001
TP111
D. FF
TP7001
TEST
TPGND

Fig. 1-5-1

1.6 EMERGENCY DISPLAY FUNCTION

This product has the function to store the last two previous emergency faults which can be displayed in the FDP when servicing.

1.6.1 How to display record of an emergency faults

Note: *Put the unit into A mode by using the VCR remote control. (When it is in B mode, the preset remote control codes are not accepted.)*

(1) Press "N" button of the presetting unit and the two previous emergency faults are shown in the LED or FDP.
(2) Press "N" button of the presetting unit again to return to the normal mode.

[Example] E : 01 : 03
Emergency fault before last (03)
Emergency fault of the last time (01)

[Example] E : — — : — — ← No record of emergency

1.6.3 How to clear emergency record

Press the COUNTER RESET button on the remote controller in the emergency record display mode, and the record of the emergency fault(s) is cleared.

1.6.2 Detail of emergency faults

EMG DATA	Symptom	Detect mode	Resulting mode
E : 01	Loading motor rotates for more than 8 Sec without shift to next mode.	Loading	POWER OFF
E : 02	Loading motor rotates for more than 8 Sec without shift to next mode.	Unloading	POWER OFF
E : 03	TU REEL FG input is absent. (for more than 4 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 04	DRUM FF input is absent. (for more than 3 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 06	CAPSTAN FG input is absent. (for more than 4 Sec)	REC/PLAY/FF/REW SEARCH FF/SEARCH REW	STOP → POWER OFF
E : 07	No SWD5V/12V	POWER ON	POWER OFF

Table 1-6-1 EMERGENCY FAULTS

1.7 SYSCON CIRCUIT

1.7.1 Syscon CPU pin function (IC3001) 1/2

PIN NO.	LABEL	IN/OUT	NOTE
1	SP_FG	IN	DETECTION SIGNAL FOR SUPPLY REEL ROTATION/TAPE REMAIN
2	TU_FG	IN	DETECTION SIGNAL FOR TAKE-UP REEL ROTATION/TAPE REMAIN
3	PAUSE/COMPU_IN	-	NC
4	EV_MASK	IN	EVENT LATCH PULSE <MOVIE ADVANCE>
5	RC	IN	REMOTE CONTROL DATA INPUT
6	LOCK(L)	IN	TUNING PLL LOCK DETECT:L
7	TU_CLK	OUT	CLOCK FOR DATA TRANSFER TO THE TUNER UNIT
8	TU_DATA	OUT	TUNING DATA
9	TU_CE	OUT	CHIP ENABLE OF THE TUNER UNIT
10	TU_A_MUTE(H)	-	NC
11	KILLER_OUT/BS_P.CTL/EP_SHORT(H)	-	NC
12	RF_CH_SEL	-	NC
13	RMO	-	NC
14	BIL_SEL/A.EVENT_DET	IN	BILINGUAL SELECT/BLANK AUDIO DETECT(DETECT ON:L) <MOVIE ADVANCE>
15	CONV_CTL(H)	OUT	R/F CONVERTER ON/OFF (ON:H, OFF:L)
16	CTL_GAIN	OUT	CONTROL AMP OUT FREQUENCY RESPONSE SWITCHING
17	I2C_DATA	IN/OUT	I/O DATA FOR THE MEMORY IC
18	I2C_CLK/TEST	OUT	SERIAL DATA TRANSFER CLOCK FOR THE MEMORY IC/MECHANISM TEST SIGNAL
19	JSA	-	NC
20	JSB	-	NC
21	SMART_P	OUT	PICTURE CONTROL (SOFT : L, EDIT/NORMAL : M, SHARP : H)
22	CAP_REV(L)	OUT	CAPSTAN MOTOR REVERSE CONTROL (FWD:H/REV:L)
23	D.FF	OUT	ROTATION DETECTION SIGNAL FOR DRUM MOTOR/TIMING CONTROL SIGNAL FOR REC
24	V.PULSE	OUT	V.PULSE ADDITION TIMING CONTROL
25	RESET	-	RESET TERMINAL (RESET ON:L)
26	A.FF	OUT	AUDIO FF OUTPUT
27	N.REC_ST(H)	OUT	NORMAL AUDIO SOUND RECORDING START
28	H.REC_ST(H)	OUT	HIFI AUDIO SOUND RECORDING START
29	EE(L)	-	NC
30	SP_SHORT(H)	-	NC
31	STL(L)	-	NC
32	P.CTL(H)	OUT	CONTROL SIGNAL FOR SWITCHING POWER SUPPLY
33	CAP_CTL_V	OUT	CAPSTAN MOTOR CONTROL
34	DRUM_CTL_V	OUT	DRUM MOTOR CONTROL
35	A.MUTE(H)	OUT	AUDIO MUTE CONTROL (MUTE:H)
36	VDD	-	SYSTEM POWER
37	X OUT	-	MAIN SYSTEM CLOCK (14.32MHz)
38	X IN	-	MAIN SYSTEM CLOCK (14.32MHz)
39	VSS	-	GND
40	XC IN	-	TIMER CLOCK (32.768kHz)
41	XC OUT	-	TIMER CLOCK (32.768kHz)
42	CLK SEL	IN	SELECT FOR BACKUP METHOD (LITHIUM OR E.CAP):H
43	P.MUTE(L)	OUT	PICTURE MUTE CONTROL (MUTE:L)
44	TU_V.MUTE(H)	OUT	TUNER VIDEO MUTE CONTROL (MUTE : H)
45	PAL_ON_M(L)/ANT_CTL(H)	-	NC
46	SYNC_DET(L)	IN	DETECTION OF VIDEO SYNC SIGNAL (DETECTED:L)
47	VIDEO_OUT	OUT	COMPOSITE VIDEO SIGNAL OUTPUT
48	VSS2	-	GND
49	CVIN	IN	COMPOSITE VIDEO SIGNAL INPUT
50	SYN_IN	IN	COMPOSITE SYNCHRONIZING SIGNAL FOR SERVO, VERTICAL SYNCHRONIZING SIGNAL FOR OSD

Table 1-7-1 SYSCON CPU pin function (1/2)

1.7.2 Syscon CPU pin function (IC3001) 2/2

PIN NO.	LABEL	IN/OUT	NOTE
51	VDD2	-	SYSTEM POWER
52	AFCC	IN	FILTER INPUT FOR HORIZONTAL SYNCHRONIZING OF OSD CHARACTER
53	AFCLPF	OUT	FILTER OUTPUT FOR HORIZONTAL SYNCHRONIZING OF OSD CHARACTER
54	FSCI	-	NC
55	FSCLPF	-	NC
56	I2C_DATA	IN/OUT	I/O DATA FOR MEMORY IC
57	I2C_CLK	OUT	SERIAL DATA TRANSFER CLOCK FOR MEMORY IC
58	LSA	IN	MECHANISM MODE DETECT(A)
59	LSB	IN	MECHANISM MODE DETECT(B)
60	LSC	IN	MECHANISM MODE DETECT(C)
61	LMC1	OUT	LOADING MOTOR DRIVE(1)
62	LMC2	OUT	LOADING MOTOR DRIVE(2)
63	LMC3	OUT	LOADING MOTOR DRIVE(3)
64	NC	-	NC
65	D.FG_IN	IN	DRUM FG PULSE INPUT
66	D.PG_IN	IN	DRUM PICKUP PULSE INPUT(SWITCHING PULSE)
67	C.FG_AMP_OUT	OUT	SET-UP OUTPUT FOR CAPSTAN FG AMPLIFICATION FACTOR
68	C.FG_IN	IN	CAPSTAN FG PULSE INPUT
69	AMP_VREF_OUT	OUT	AMP CIRCUIT REFERENCE VOLTAGE OUTPUT
70	AMP_VREF_IN	IN	AMP CIRCUIT REFERENCE VOLTAGE INPUT
71	AVSS	-	GND
72	AMP_C	IN	CAPACITOR CONNECT TERMINAL FOR CTL AMP CIRCUIT
73	AVCC	-	SYSTEM POWER
74	CTL_+	IN/OUT	CTL(+) SIGNAL
75	CTL_-	IN/OUT	CTL(-) SIGNAL
76	CTL_AMP_OUT	OUT	CTL PULSE OUTPUT
77	C	-	NC
78	P.SAVE(L)	-	NC
79	V.UP(H)	-	NC
80	JUST_CLK	-	NC
81	A.ENV/ND(L)	IN	AUDIO PB FM ENV.INPUT/NON HiFi MODE: L
82	VIDEO_ENV	IN	AUTO TRACKING DETECT/INPUT THE AVERAGE OF PLAYBACK VIDEO SIGNAL
83	START_SENSOR	IN	START SENSOR
84	END_SENSOR	IN	END SENSOR
85	AFC	IN	TUNING CHECK
86	LED/V.EVENT_DET	IN	NC/BLANK VIDEO DETECT (DETECT ON : L) <MOVIE ADVANCE>
87	BS_ANT_ON(H)	-	NC
88	IND(L)	-	NC
89	IND(R)	-	NC
90	REC_SAFETY	IN	REC SAFETY SWITCH DETECT (SW ON:L)
91	POWER_DET	IN	DETECTION SIGNAL FOR POWER DOWN OF AC POWER SUPPLY
92	N.REC(H)	OUT	NORMAL AUDIO REC MODE CONTROL (REC:H)
93	COMPU_OUT	-	NC
94	PROTECT	IN	DETECTION SIGNAL FOR SW. POWER SUPPLY
95	STB	OUT	STROBE (FOR FDP DRIVER)
96	S.CLK	OUT	SERIAL DATA TRANSMISSION CLOCK FROM THE FDP DRIVER TO THE ON-SCREEN IC
97	S_DATA_FRSYS	OUT	SERIAL DATA TRANSFER OUTPUT FROM THE FDP DRIVER TO THE ON-SCREEN IC
98	S_DATA_TOSYS	IN	SERIAL DATA TRANSFER OUTPUT FROM THE ON-SCREEN IC TO THE FDP DRIVER
99	PAL_EP_CTL/BS(H)	-	NC
100	BIT_IN(H)	-	NC

Table 1-7-2 SYSCON CPU pin function (2/2)

SECTION 2
MECHANISM ADJUSTMENT

2.1 BEFORE STARTING REPAIR AND ADJUSTMENT

2.1.1 Precautions

(1) Unplug the power cable of the main unit before using your soldering iron.
(2) Take care not to cause any damage to the conductor wires when plugging and unplugging the connectors.
(3) Do not randomly handle the parts without identifying where the trouble is.
(4) Exercise enough care not to damage the lugs, etc. during the repair work.
(5) When installing the front panel assembly, be sure to hook the lug on the back side of the cassette door to the door opener of the cassette holder. If this operation is neglected it will not be possible to remove the cassette when ejecting because the housing door cannot be opened.

2.1.2 Checking for Proper Mechanical Operations

Enter the mechanism service mode when you want to operate the mechanism when no cassette is loaded. (See 1.5 MECHANISM SERVICE MODE.)

2.1.3 Manually Removing the Cassette Tape

1. In case of electrical failures

If you cannot remove the cassette tape which is loaded because of any electrical failure, manually remove it by taking the following steps.

(1) Unplug the power cable and remove the top cover, bracket and front panel assembly. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD.)
(2) Unload the cassette by manually turning the loading motor of the mechanism assembly toward the front. In doing so, hold the tape by the hand to keep the slack away from any grease. (See Fig.2-1-1.)
(3) Bring the pole base assembly (supply or take-up side) to a pause when it reaches the position where it is hidden behind the cassette tape.
(4) Move the top guide toward the drum while holding down the lug Ⓐ of the bracket retaining the top guide. Likewise hold part Ⓑ down and remove the top guide. Section Ⓒ of the top guide is then brought under the cassette lid. Then remove the top guide by pressing the whole cassette tape down. (See Fig.2-1-2.)
(5) Remove the cassette tape by holding both the slackened tape and the cassette lid.
(6) Take up the slack of the tape into the cassette. This completes removal of the cassette tape.

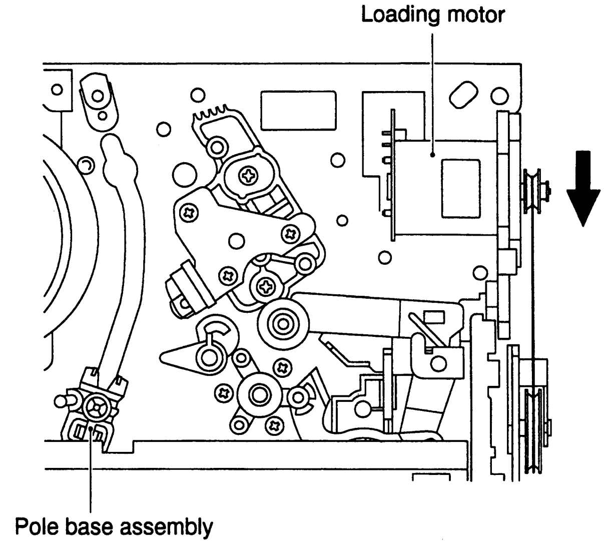


Fig. 2-1-1

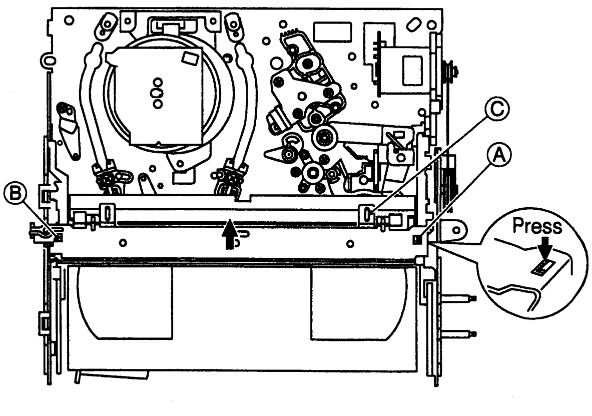


Fig. 2-1-2

2. In case of mechanical failure

If you cannot remove the cassette tape which is loaded because of any mechanical failure, manually remove it by taking the following steps.

(1) Unplug the power cable and remove the top cover, front panel assembly and others so that the mechanism assembly is visible. (See 1.3 DISASSEMBLY/ASSEMBLY METHOD.)

(2) While keeping the tension arm assembly of the mechanism assembly free from tension, pull the tape on the pole base assembly (supply or take-up side) out of the guide roller. (See Fig.2-1-3.)

(3) Take the spring of the pinch roller arm assembly off the hook of the press lever assembly, and detach it from the tape. (See Fig.2-1-4.)

(4) In the same way as in the electrical failure instructions in 2.1.3 (4), remove the top guide.

(5) Raise the cassette tape cover. By keeping it in that position, draw out the cassette tape case from the cassette holder and take out the tape.

(6) By hanging the pinch roller arm assembly spring back on the hook, take up the slack of the tape into the cassette.

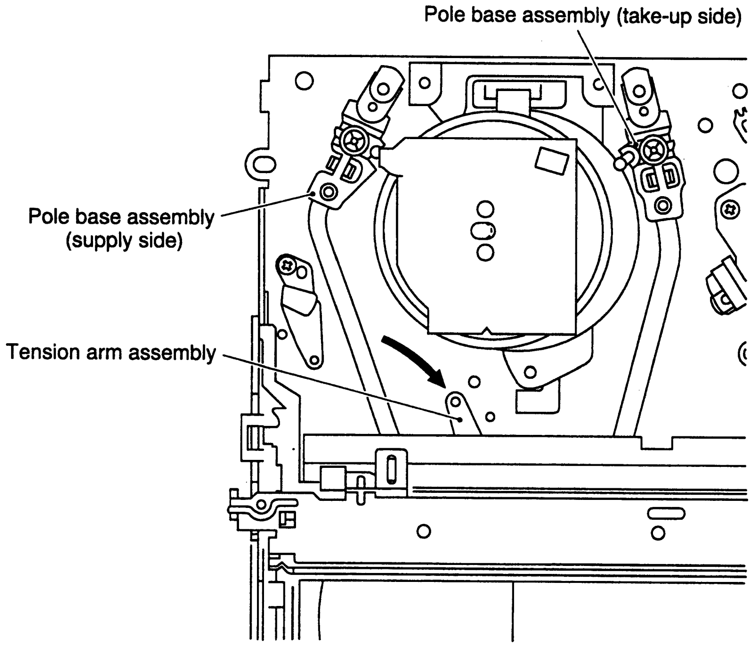

Pole base assembly (take-up side)
Pole base assembly (supply side)
Tension arm assembly

Fig. 2-1-3

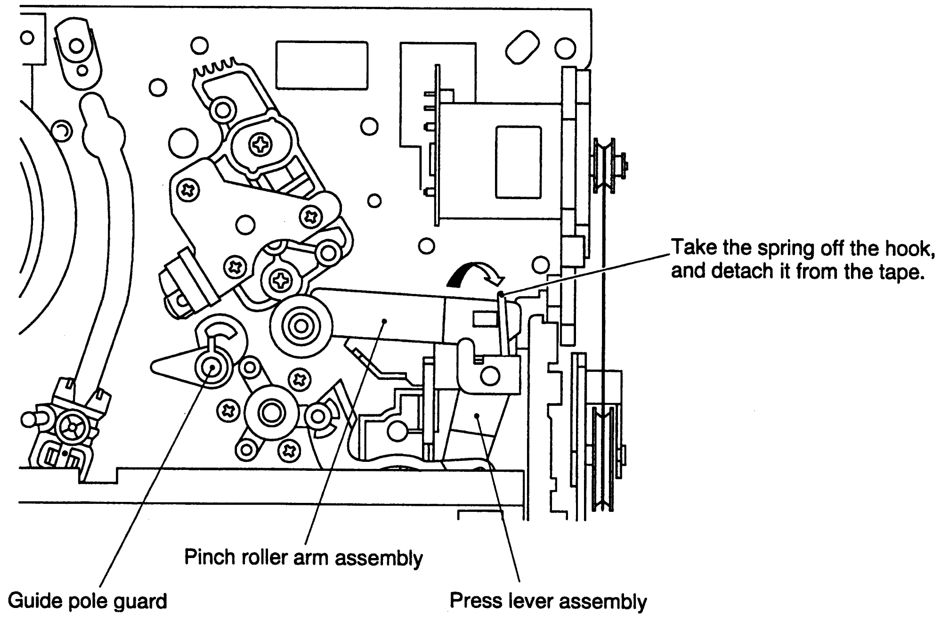

Take the spring off the hook, and detach it from the tape.
Pinch roller arm assembly
Guide pole guard
Press lever assembly

Fig. 2-1-4

2.1.4 Jigs and Tools Required for Adjustment

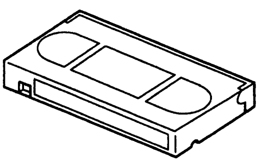
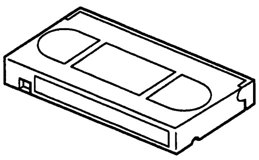
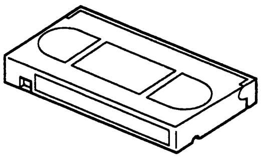
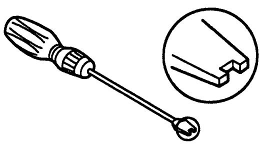
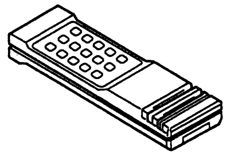
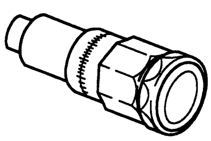
Alignment tape (SP) MHP	Alignment tape (EP) MHP-L	Back tension cassette gauge PUJ48076-2	A/C head position bit PTU94010
			
Roller driver PTU94002	Presetting unit PTU94008	Torque gauge PUJ48075-2	
			

Table 2-1-1 Jigs and tools required for adjustment

2.1.5 Maintenance and Inspection

1. Location of major mechanical parts

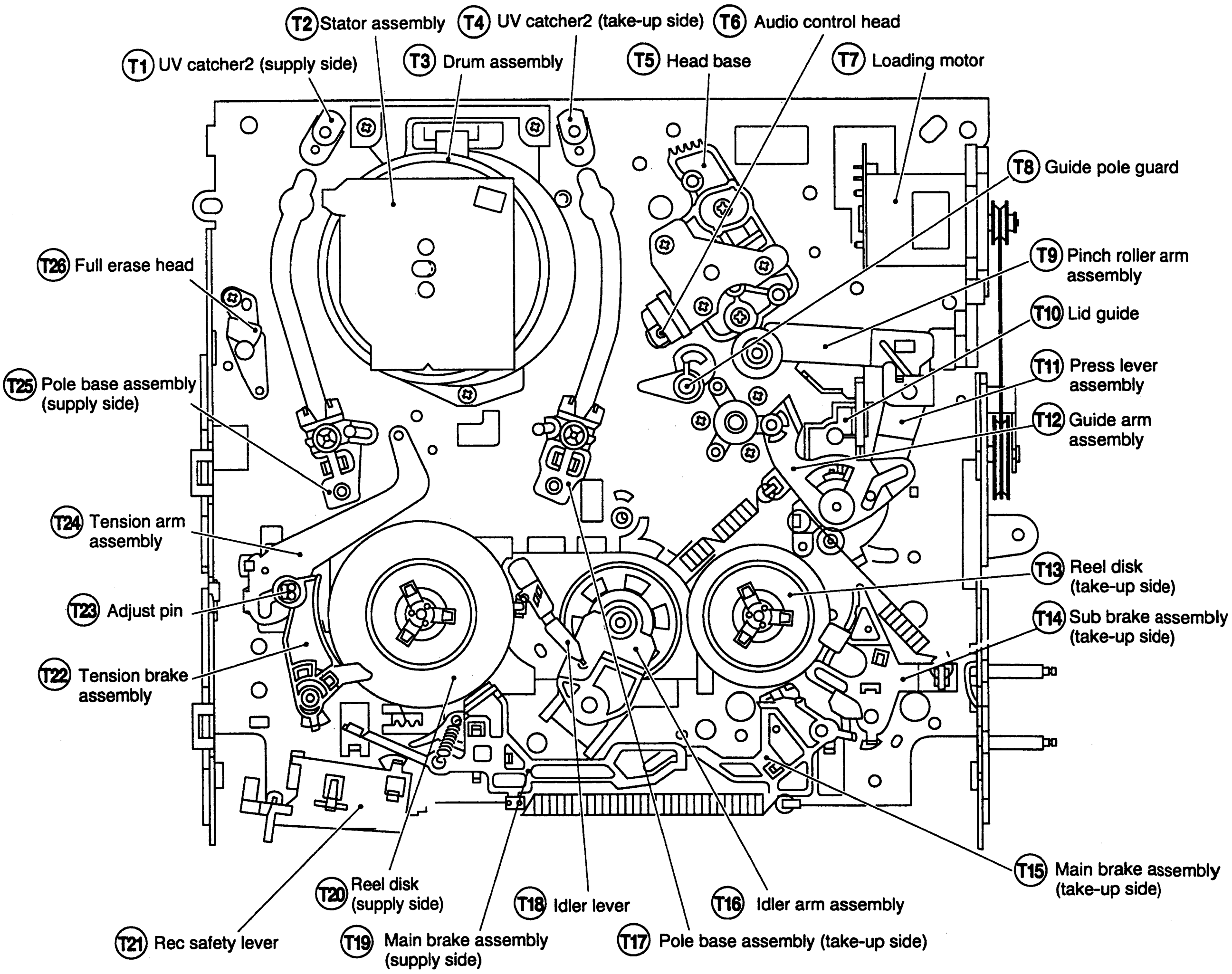

T2 Stator assembly
T4 UV catcher2 (take-up side)
T6 Audio control head
T1 UV catcher2 (supply side)
T3 Drum assembly
T5 Head base
T7 Loading motor
T8 Guide pole guard
T9 Pinch roller arm assembly
T10 Lid guide
T11 Press lever assembly
T12 Guide arm assembly
T13 Reel disk (take-up side)
T14 Sub brake assembly (take-up side)
T15 Main brake assembly (take-up side)
T26 Full erase head
T25 Pole base assembly (supply side)
T24 Tension arm assembly
T23 Adjust pin
T22 Tension brake assembly
T20 Reel disk (supply side)
T18 Idler lever
T16 Idler arm assembly
T21 Rec safety lever
T19 Main brake assembly (supply side)
T17 Pole base assembly (take-up side)

Fig. 2-1-5 Mechanism assembly top side

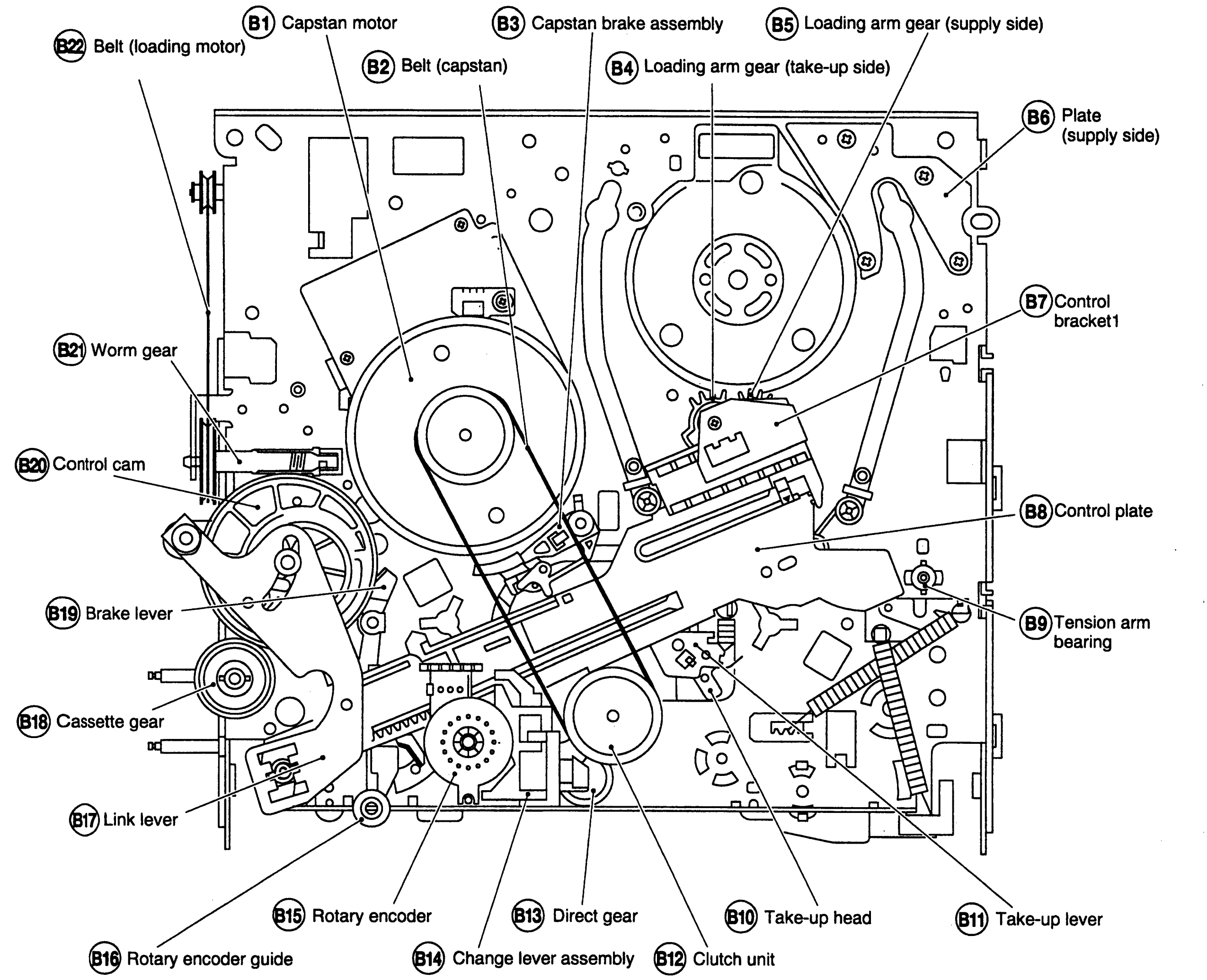

B1 Capstan motor
B22 Belt (loading motor)
B3 Capstan brake assembly
B5 Loading arm gear (supply side)
B2 Belt (capstan)
B4 Loading arm gear (take-up side)
B6 Plate (supply side)
B7 Control bracket1
B21 Worm gear
B20 Control cam
B8 Control plate
B19 Brake lever
B9 Tension arm bearing
B18 Cassette gear
B17 Link lever
B15 Rotary encoder
B13 Direct gear
B10 Take-up head
B11 Take-up lever
B16 Rotary encoder guide
B14 Change lever assembly
B12 Clutch unit

Fig. 2-1-6 Mechanism assembly bottom side

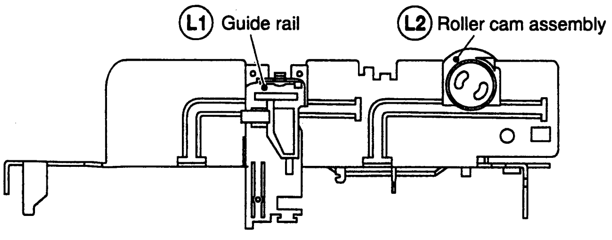

L1 Guide rail
L2 Roller cam assembly

Fig. 2-1-7 Mechanism assembly left side

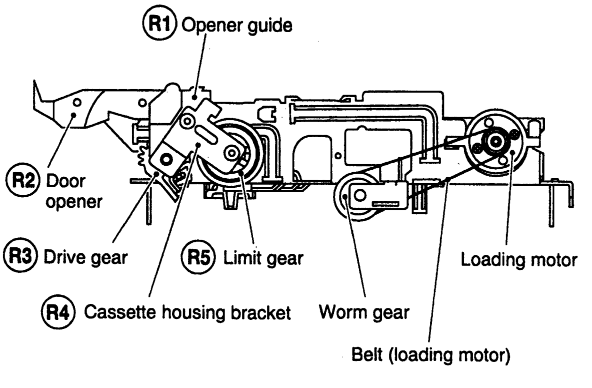

R1 Opener guide
R2 Door opener
R3 Drive gear
R5 Limit gear
Loading motor
R4 Cassette housing bracket
Worm gear
Belt (loading motor)

Fig. 2-1-8 Mechanism assembly right side

Note: *This table shows the order in which parts are removed for replacement. To replace parts, remove them in the order of 1 to 18 as shown in the table. To install them, reverse the removal sequence.*
The circled numbers (symbols and numbers) preceding the individual part names represent the numbers in the "Location of major mechanical parts" table. Also, the "T", "B", and "T/B" on the right of each part name shows that the particular part is removed from the front, from the back, and from both sides of the mechanism, respectively.

Symbols and numbers	Removal parts / (Reference items) Replacement parts	Front (T)/Back (B) of mechanism	Nomber of removal steps	Guide rail	Roller cam assembly	Cassette housing bracket	Opener guide	Relay gear	Cassette holder assembly	Drive gear	Drive arm	Pinch roller arm assembly	Guide arm assembly	Press lever assembly	UV catcher2	Rotary encoder	Clutch unit	Change lever assembly	Direct gear	Link lever	Worm gear	Control bracket1	Control plate	Loading arm gear (supply side)	Loading arm gear (take-up side)	Take-up lever	Sub brake assembly (take-up side)	Main brake assembly (take-up side)	Reel disk (take-up side)	Tension brake assembly	Tension arm assembly	Idler lever	Brake lever
	Symbols and numbers			(L1)	(L2)	(R4)	(R1)	—	—	(R3)	—	(T9)	(T12)	(T11)	(T1)(T4)	(B15)	(B12)	(B14)	(B13)	(B17)	(B21)	(B7)	(B8)	(B5)	(B4)	(B11)	(T14)	(T15)	(T13)	(T22)	(T24)	(T18)	(B19)
(L1)	2.2.3 Guide rail	T	1																														
(L2)	2.2.3 Roller cam assembly	T	1																														
(R4)	2.2.3 Cassette housing bracket	T	1																														
(R1)	2.2.3 Opener guide	T	2			1																											
(R2)	2.2.3 Door opener	T	3			1	2																										
—	2.2.3 Relay gear	T	3			1	2																										
(R5)	2.2.3 Limit gear	T	3			1	2																										
—	2.2.3 Cassette holder assembly	T	6	1	2	3	4	5																									
(R3)	2.2.3 Drive gear	T	4			1	2	3																									
—	2.2.3 Drive arm	T	8	1	2	3	4	5	6	7																							
(T9)	2.2.4 Pinch roller arm assembly	T	1																														
(T12)	2.2.5 Guide arm assembly	T	1																														
(T11)	2.2.5 Press lever assembly	T	3									1	2																				
(T6)	2.2.6 Audio control head	T	1																														
(T7)	2.2.7 Loading motor	T	1																														
(B1)	2.2.8 Capstan motor	T/B	1																														
(T1)(T4)	2.2.9 UV catcher2	T	1																														
(T17)	2.2.9 Pole base assembly (take-up side)	T/B	2												1																		
(T25)	2.2.9 Pole base assembly (supply side)	T/B	2												1																		
(B15)	2.2.10 Rotary encoder	B	1																														
(B12)	2.2.11 Clutch unit	B	1																														
(B14)	2.2.12 Change lever assembly	B	3													1	2																
(B13)	2.2.12 Direct gear	B	4													1	2	3															
—	2.2.12 Clutch gear1	B	5													1	2	3	4														
(B17)	2.2.13 Link lever	B	1																														
(B18)	2.2.14 Cassette gear	B	2																	1													
(B20)	2.2.14 Control cam	B	2																	1													
(B21)	2.2.14 Worm gear	B	1																														
(T10)	- Lid guide	T/B	5									1	2	3							4												
(B7)	2.2.15 Control bracket1	B	1																														
(B8)	2.2.15 Control plate	B	6													1	2	3		4		5											
(B5)	2.2.16 Loading arm gear (supply side)	B	7													1	2	3		4		5	6										
(B4)	2.2.16 Loading arm gear (take-up side)	B	8													1	2	3		4		5	6	7									
—	2.2.16 Loading arm gear shaft	B	9													1	2	3		4		5	6	7	8								
(B11)	2.2.17 Take-up lever	T/B	7													1	2	3		4		5	6										
(B10)	2.2.17 Take-up head	T/B	8													1	2	3		4		5	6			7							
—	2.2.17 Control plate guide	T/B	8													1	2	3		4		5	6			7							
(B3)	2.2.18 Capstan brake assembly	T/B	7													1	2	3		4		5	6										
(T14)	2.2.19 Sub brake assembly(take-up side)	T/B	15	1	2	3	4	5	6	7	8					9	10	11		12		13	14										
(T15)	2.2.20 Main brake assembly(take-up side)	T/B	16	1	2	3	4	5	6	7	8					9	10	11		12		13	14				15						
(T19)	2.2.20 Main brake assembly(supply side)	T/B	9	1	2	3	4	5	6	7	8																						
(T13)	2.2.20 Reel disk (take-up side)	T/B	16	1	2	3	4	5	6	7	8					9	10	11		12		13	14				15						
(T22)	2.2.21 Tension brake assembly	T/B	9	1	2	3	4	5	6	7	8																						
(T20)	2.2.21 Reel disk (supply side)	T/B	10	1	2	3	4	5	6	7	8																			9			
(T24)	2.2.21 Tension arm assembly	T/B	10	1	2	3	4	5	6	7	8																			9			
(B9)	2.2.21 Tension arm bearing	T/B	10	1	2	3	4	5	6	7	8																			9			
(T18)	2.2.22 Idler lever	T/B	17	1	2	3	4	5	6	7	8					9	10	11		12		13	14							15	16		
(T16)	2.2.22 Idler arm assembly	T/B	18	1	2	3	4	5	6	7	8					9	10	11		12		13	14							15	16	17	
(B19)	- Brake lever	T/B	18	1	2	3	4	5	6	7	8					9	10	11		12		13	14				15	16	17				
(B16)	- Rotary encoder guide	T/B	19	1	2	3	4	5	6	7	8					9	10	11		12		13	14				15	16	17				18

2. Cleaning

Regular cleaning of the transport system parts is desirable but practically impossible. So make it a rule to carry out cleaning of the tape transport system whenever the machine is serviced.

When the video head, tape guide and/or brush get soiled, the playback picture may appear inferior or at worst disappear, resulting in possible tape damage.

(1) When cleaning the upper drum (especially the video head), soak a piece of closely woven cloth or Kimu-wipe with alcohol and while holding the cloth onto the upper drum by the fingers, turn the upper drum counterclockwise.

Note: ***Absolutely avoid sweeping the upper drum vertically as this will cause damage to the video head.***

(2) To clean the parts of the tape transport system other than the upper drum, use a piece of closely woven cloth or a cotton swab soaked with alcohol.
(3) After cleaning, make sure that the cleaned parts are completely dry before using the video tape.

3. Lubrication

With no need for periodical lubrication, you have only to lubricate new parts after replacement. If any oil or grease on contact parts is soiled, wipe it off and newly lubricate the parts.

(1) See the mechanism assembly and disassembly diagrams (M4) for the lubricating or greasing spots. See Table 2-1-2 for the types of oil or grease to be used.

Type	Name	Serial No.	Symbols on the disassembly diagrams
Grease	Maltemp SH-P	KYODO-SH-P	AA
Oil	Cosmohydro HV56	COSMO-HV56	BB

Table 2-1-2 Grease and oil used for the unit

4. Suggested servicing schedule for main components

The following table indicates the suggested period for such service measures as cleaning,lubrication and replacement. In practice, the indicated periods will vary widely according to environmental and usage conditions.However, the indicated components should be inspected when a set is brought for service and the maintenance work performed if necessary. Also note that rubber parts may deform in time,even if the set is not used.

System	Parts Name	Operation Hours	
		~1000H	~2000H
Tape transport	Upper drum assembly	★○	○
	A/C head	★○	★○
	Lower drum assembly	★	★○
	Pinch roller arm assembly	★	★
	Full erase head	★	★
	Tension arm assembly	★	★
	Capstan motor (Shaft)	★	★
	Guide arm assembly	★	★
Drive	Capstan motor		○
	Capstan brake assembly		○
	Main brake assembly		○
	Belt (Capstan)	○	○
	Belt (Loading motor)		○
	Loading motor		○
	Clutch unit		○
	Worm gear		○
	Control plate		○
Other	Brush	★○	★○
	Tension brake assembly	○	○
	Rotary encoder		○

★: Cleaning
○: Inspection or Replacement if necessary

Table 2-1-3

2.2 REPLACEMENT OF MAJOR PARTS

2.2.1 Before Starting Disassembling (Phase matching between mechanical parts)

The mechanism of this unit is closely linked with the rotary encoder and system controller circuits.

Since the system controller detects the status of mechanical operation in response to phases of the rotary encoder (internal switch positions), the mechanism may not operate properly unless such parts as the rotary encoder, control plate, loading arm gear, control cam, cassette gear, limit gear, relay gear and drive gear are installed in their correct positions.

Especially, this model is not provided with any cassette housing assembly, so that cassette loading and unloading must be accomplished by operation of the cassette holder assembly. The latter is in turn driven by such parts as the drive gear, relay gear and limit gear. Exercise enough care, therefore, to have the phases of all this gear matching one another.

(For information on phase matching of the mechanism, see the instructions on how to install individual parts.)

This unit is provided with a mechanism assembly mode. It is therefore necessary to enter this mode for assembling and disassembling procedures.
This mode is usually not in use, manually set it when it is required.

2.2.2 How to Set the Mechanism Assembling Mode

Remove the mechanism assembly and place it bottom side up. (See SECTION 1 DISASSEMBLY.) Turn the worm gear toward the front so that the guide hole of the control cam is brought into alignment with the hole at the mechanism assembly chassis. This position renders the mechanism assembling mode operational. Make sure that the control plate is located in alignment with the mark E. (See Fig.2-2-1.)

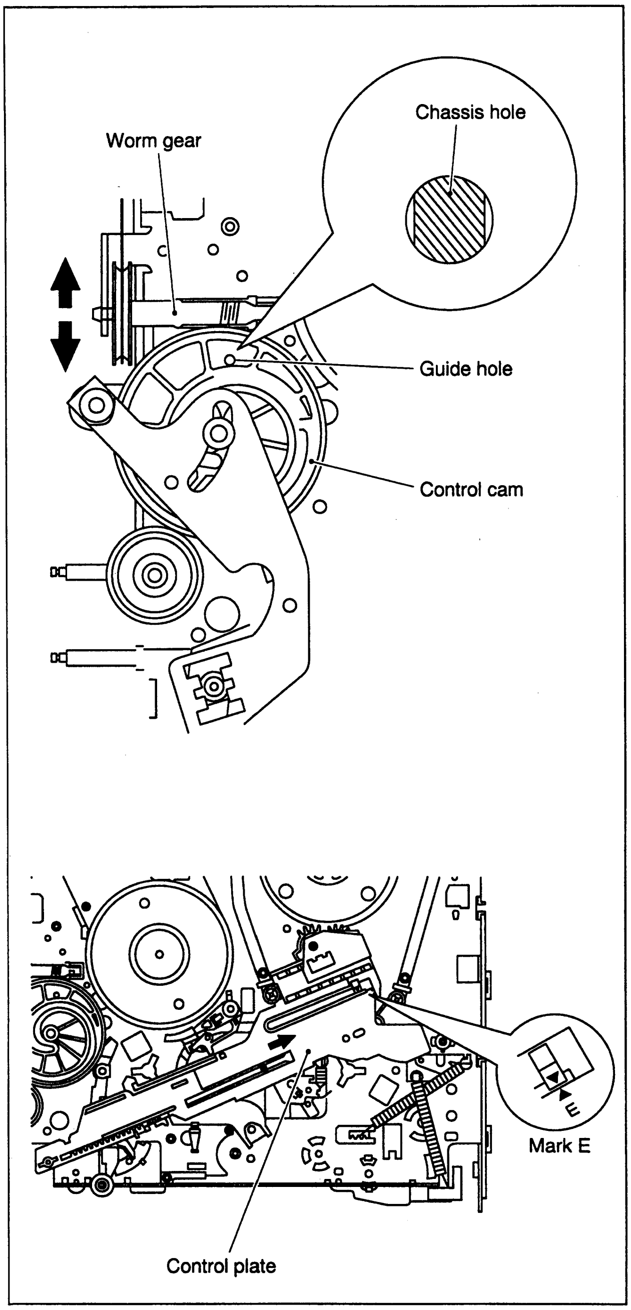

Chassis hole
Worm gear
Guide hole
Control cam
E
Mark E
Control plate

Fig. 2-2-1

2.2.3 Cassette Holder Assembly

1. How to remove

(1) Remove the guide rail and roller cam assembly. (See Fig.2-2-2.)
(3 lugs on the guide rail and one lug on the roller cam assembly)

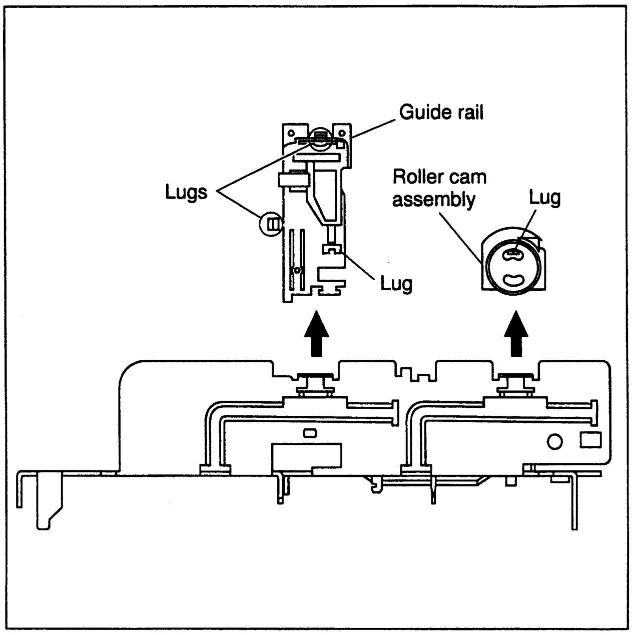

Guide rail
Roller cam assembly
Lugs
Lug
Lug

Fig. 2-2-2

(2) Remove the two slit washers and remove the cassette housing bracket. (See Fig.2-2-3.)
(3) Remove the opener guide, spring(A), door opener, relay gear and limit gear. (See Fig.2-2-3.)

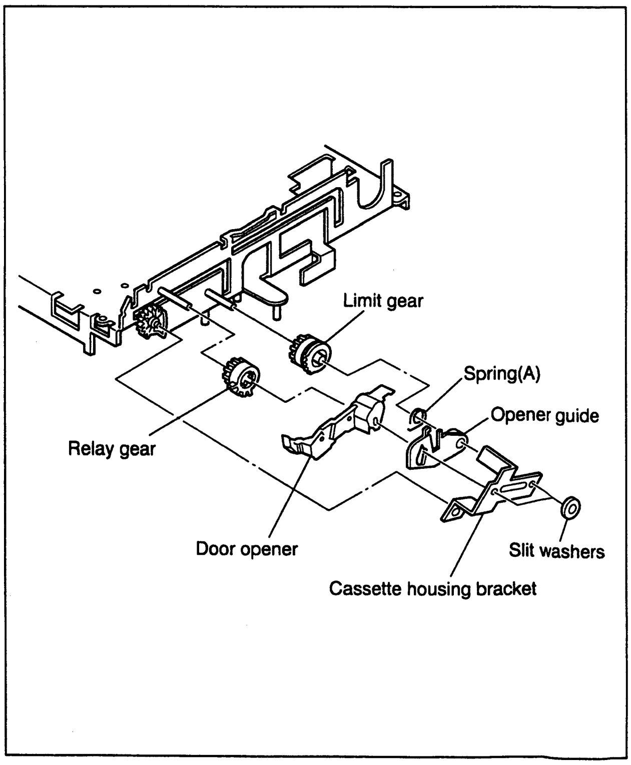

Limit gear
Spring(A)
Opener guide
Relay gear
Door opener
Slit washers
Cassette housing bracket

Fig. 2-2-3

(4) While swinging the lock levers (R) and (L) of the cassette holder assembly toward the front, slide the cassette holder assembly until its legs come to where the guide rail and the roller cam assembly have been removed (so that the drive arm is upright). (See Fig.2-2-4.)

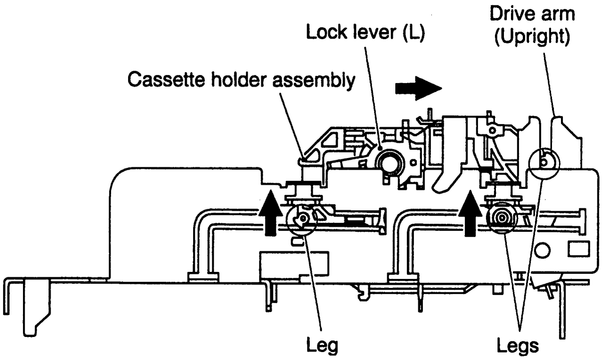

Drive arm (Upright)
Lock lever (L)
Cassette holder assembly
Leg
Legs

Fig. 2-2-4

(5) While holding the left side of the cassette holder, lift the cassette holder assembly so that the three legs on the left side are all released. Then pull the legs Ⓐ and Ⓑ on the right side out of the rail and also pull up the leg Ⓒ. (See Fig.2-2-5 and Fig.2-2-6.)

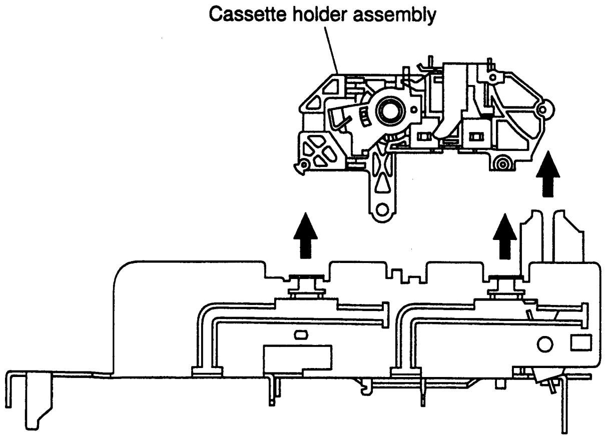

Cassette holder assembly

Fig. 2-2-5

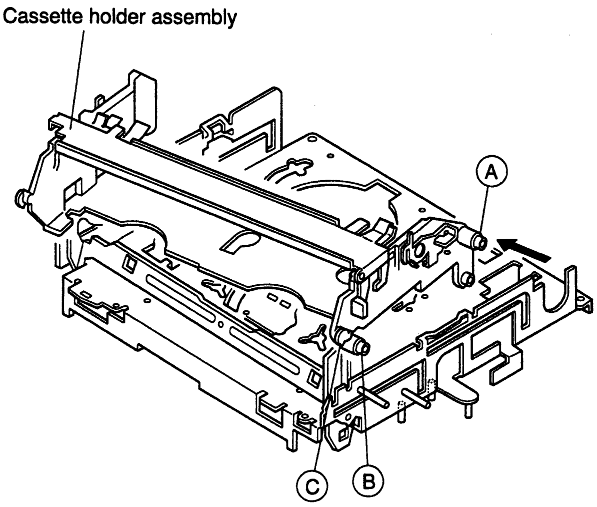

Cassette holder assembly
Ⓐ
Ⓒ
Ⓑ

Fig. 2-2-6

(6) Draw out the drive gear, and remove the drive arm.

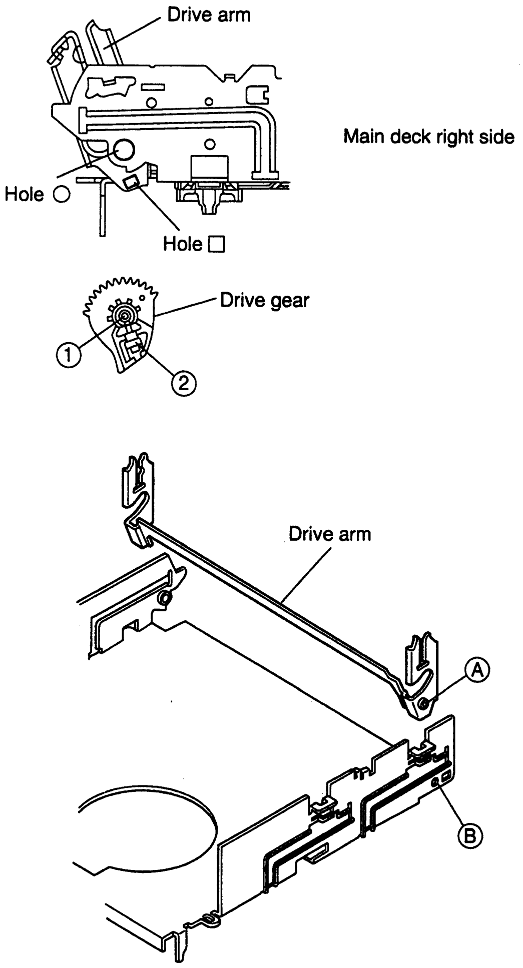

Drive arm
Main deck right side
Hole ○
Hole □
Drive gear
①
②
Drive arm
Ⓐ
Ⓑ

Fig. 2-2-7

2. How to install (Phase matching)

(1) Insert the section Ⓐ of the drive arm into the section Ⓑ of the main deck.

(2) Insert the section ① of the drive gear into the round hole, and the section ② into the square hole on the drive arm. (See Fig.2-2-7.)

(3) Hold the drive arm upright and fit the leg Ⓒ on the right side of the cassette holder assembly into the groove. (See Fig.2-2-8.)

(4) While swinging the lock lever (R) of the cassette holder assembly toward the front, put the legs Ⓐ and Ⓑ into the rail. (See Fig.2-2-8.)

(5) Drop the three legs on the left side of the cassette holder assembly into the groove at one time. (See Fig.2-2-9.)

(6) Slide the whole cassette holder assembly toward the front to bring it to the eject end position.

(7) Install the limit gear so that the notch on the outer circumference of the limit gear is brought into alignment with the guide hole on the main deck. (See Fig.2-2-10.)

(8) Install so that the notch on the periphery of the relay gear is aligned with the notch of the main deck and that hole A of the relay gear is aligned with the hole A of the limit gear and that hole B of the relay gear is aligned with the hole B of the drive gear. (See Fig.2-2-10.)

(9) Install the door opener, opener guide, spring(A) and cassette housing bracket and fasten the two slit washers.

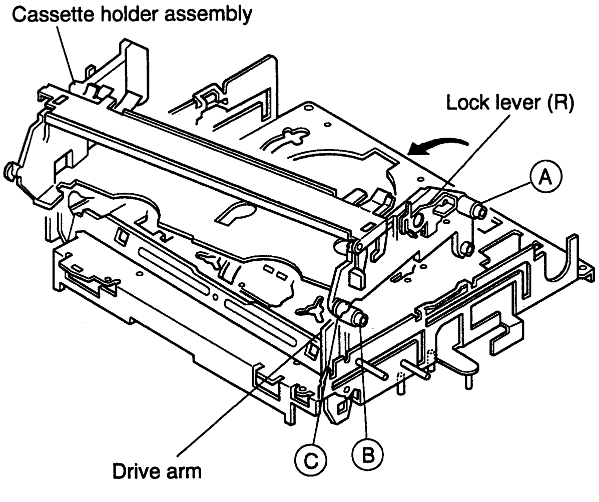

Cassette holder assembly
Lock lever (R)
Ⓐ
Drive arm
Ⓒ
Ⓑ

Fig. 2-2-8

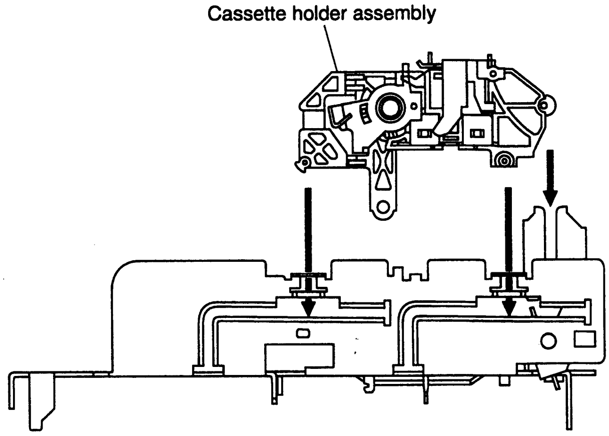

Cassette holder assembly

Fig. 2-2-9

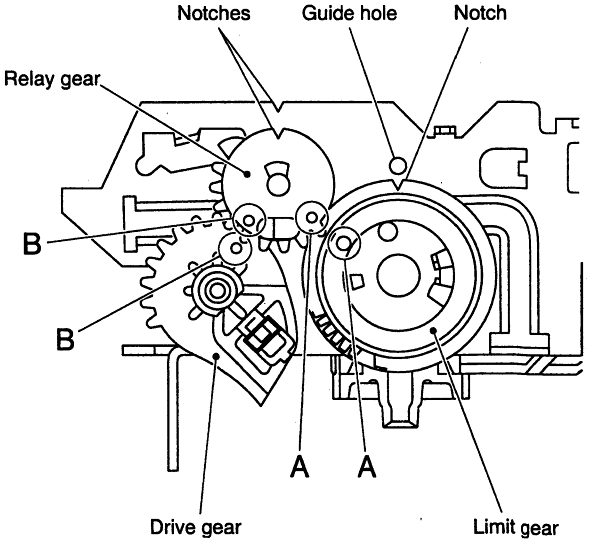

Notches
Guide hole
Notch
Relay gear
B
B
A
A
Drive gear
Limit gear

Fig. 2-2-10

2.2.4 Pinch Roller Arm Assembly

1. How to remove

(1) Remove the spring from the hook of the press lever assembly.

(2) Remove the slit washer and remove the pinch roller seat 2. (See Fig.2-2-11.)

(3) Remove the pinch roller arm assembly by pulling it up.

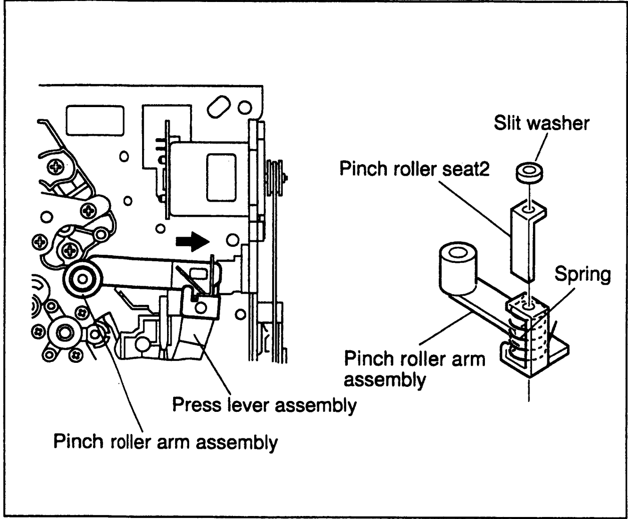

Slit washer
Pinch roller seat2
Spring
Pinch roller arm assembly
Press lever assembly
Pinch roller arm assembly

Fig. 2-2-11

2.2.5 Guide Arm Assembly and Press Lever Assembly

1. How to remove

(1) Remove the spring and expand the lug of the lid guide in the arrow-indicated direction. Then remove the guide arm assembly by pulling it up.

(2) Remove the press lever assembly by pulling it up. (See Fig.2-2-12.)

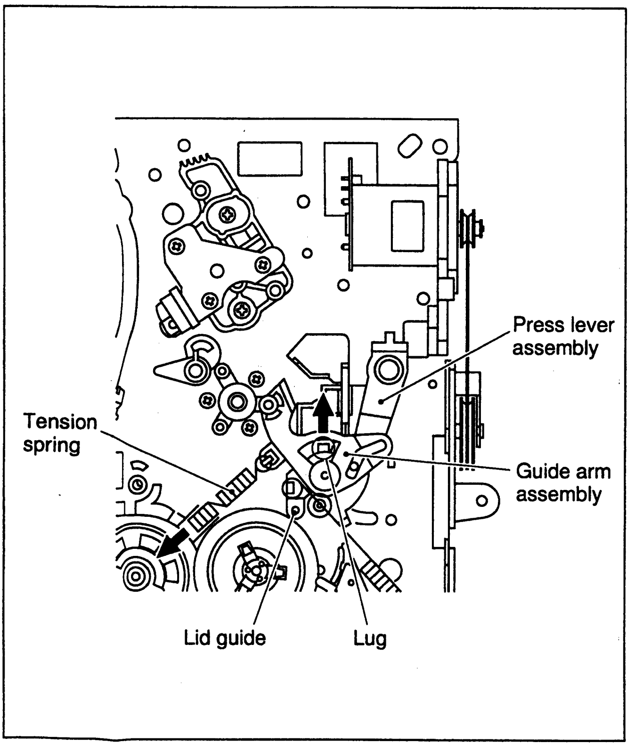

Press lever assembly
Tension spring
Guide arm assembly
Lid guide
Lug

Fig. 2-2-12

2.2.6 Audio Control Head

1. How to remove

(1) Remove the two screws (A) and remove the audio control head together with the head base.

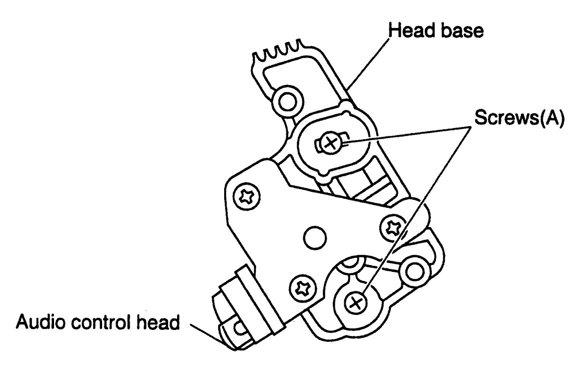

Head base
Screws(A)
Audio control head

Fig. 2-2-13

(2) When replacing only the audio control head, remove the three screws (B) while controlling the compression spring.

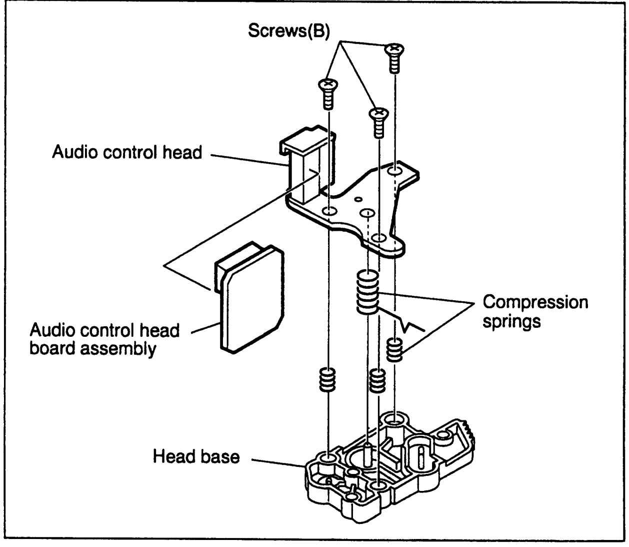

Screws(B)
Audio control head
Compression springs
Audio control head board assembly
Head base

Fig. 2-2-14

2. How to install

(1) To make the post-installation adjustment easier, set the temporary level as indicated in Fig.2-2-15. Also make sure that the screw center is brought into alignment with the center position of the slot.

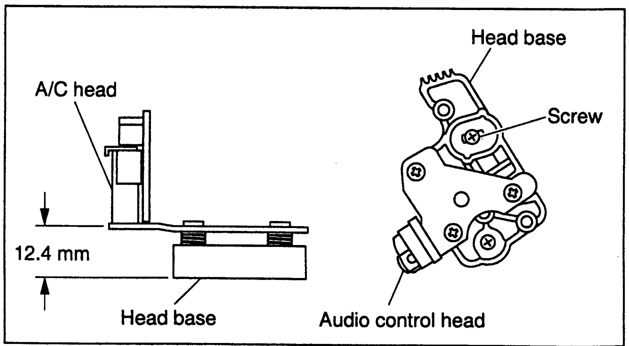

Head base
A/C head
Screw
12.4 mm
Head base
Audio control head

Fig. 2-2-15

2.2.7 Loading Motor

1. How to remove

(1) Remove the belt wound around the worm gear.

(2) Open the two lugs of the motor guide and remove the loading motor, loading motor board assembly and motor guide altogether by pulling them up.

(3) When replacing the loading motor board assembly, take care with the orientation of the loading motor. (Install so that the loading motor label faces upward.)

(4) When the motor pulley has been replaced, choose the fitting dimension as indicated in Fig.2-2-16.

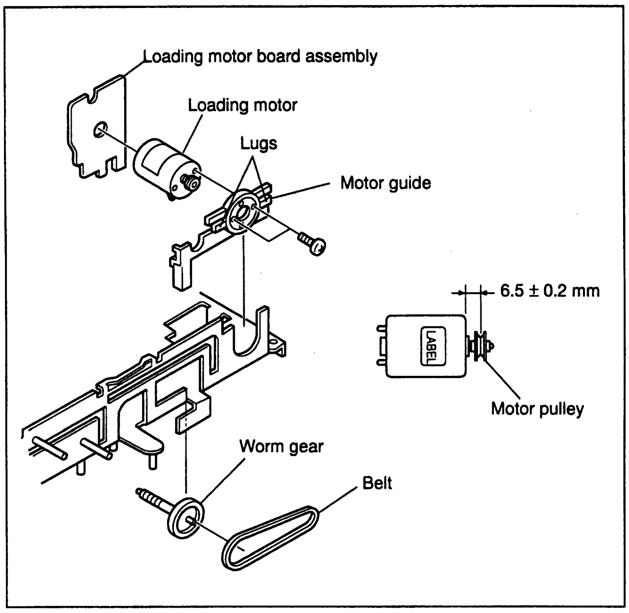


Fig. 2-2-16

2.2.8 Capstan Motor

1. How to remove

(1) Remove the belt (capstan) on the mechanism assembly back side.

(2) Remove the three screws (A) and remove the capstan motor.

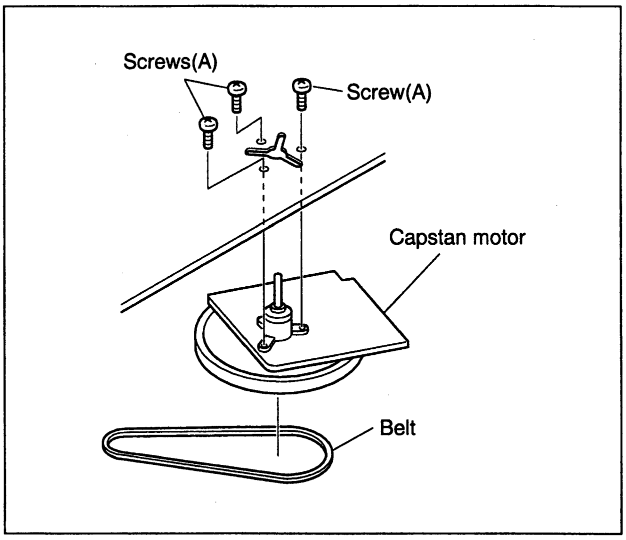


Fig. 2-2-17

2. How to install (Centering the mounting position)

When the capstan motor has once been removed and then reinstalled out of the initial correct position in the rotational direction, the capstan motor current may be unstable during operation in high or low temperatures. This may result in greater Wow & Flutter and occasionally in power breakdown because of current over - load. Install the capstan motor while following the procedure given below.

(The capstan motor is centrally located when the unit is shipped from the factory.)

(1) Provisionally tighten the three screws (A) securing the capstan motor.

(2) Install the mechanism assembly to which the capstan motor is provisionally fastened on the bottom chassis which incorporates the Main board assembly. (No need to tighten the screws for mounting the mechanism.) Make sure that all the connectors for the mechanism assembly and the Main board assembly are correctly installed as indicated in Fig. 2-2-18.

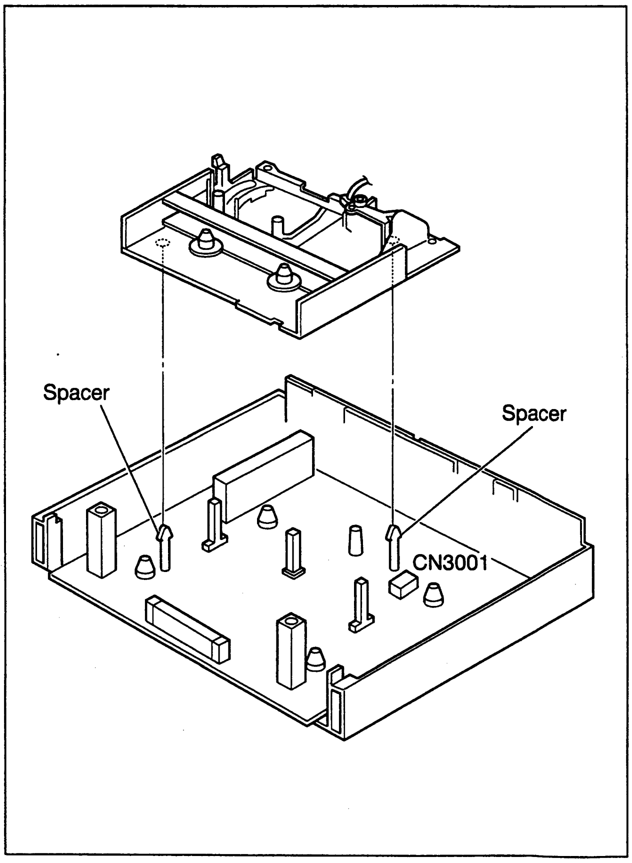


Fig. 2-2-18

(3) Making sure that the connector CN3001 of the capstan motor is correctly mounted, and securely tighten the three screws (A).

Note: ***When the capstan motor has been replaced with a new one, perform recording in the EP mode for at least 2 minutes at normal temperatures immediately before starting the FF/REW or SEARCH operations (Aging).***

2.2.9 Pole Base Assembly (supply or take-up side)

1. How to remove

(1) Remove the UV catcher 2 on the removal side by loosening the screw (A).

(2) Remove the pole base assembly on the supply side from the mechanism assembly by loosening the screw (B) on the mechanism assembly back side and sliding the pole base assembly toward the UV catcher 2.

(3) As for the pole base assembly on the take-up side, turn the pulley of the loading motor to lower the cassette holder because the screw (B) is hidden under the control plate. (See the "Procedures for Lowering the Cassette holder assembly" of 1.3 DISASSEMBLY/ASSEMBLY METHOD.) Further turn the motor pulley to move the cassette holder until the screw (B) is no longer under the control plate (in the half-loading position). Then remove it as done for the supply side by removing the screw (B).

NOTE: *After reinstalling the Pole base assembly and the UV catcher2, be sure to perform compatibility adjustment.*

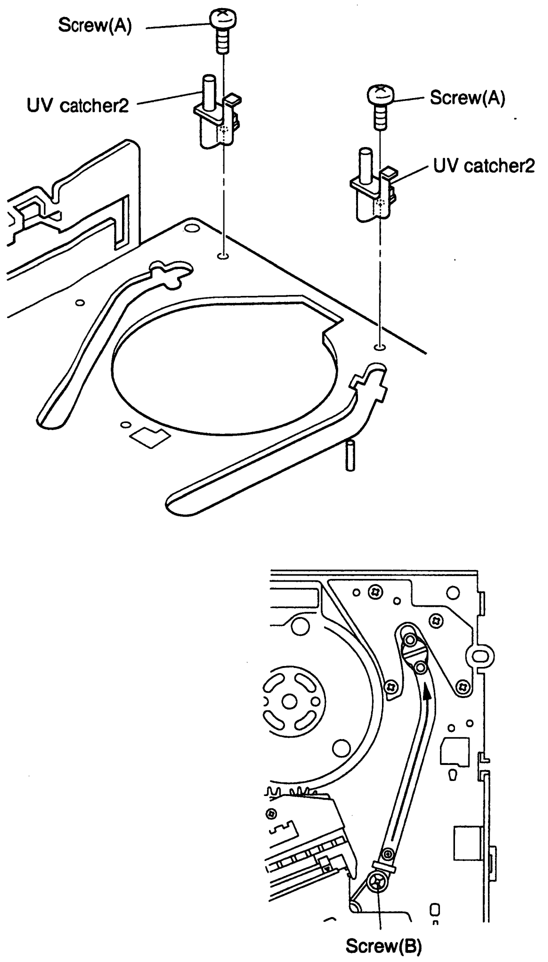

Screw(A)
UV catcher2
Screw(A)
UV catcher2
Screw(B)

Fig. 2-2-19

2.2.10 Rotary Encoder

1. How to remove

(1) Remove the screw (A) and remove the rotary encoder by pulling it up. (See Fig. 2-2-20.)

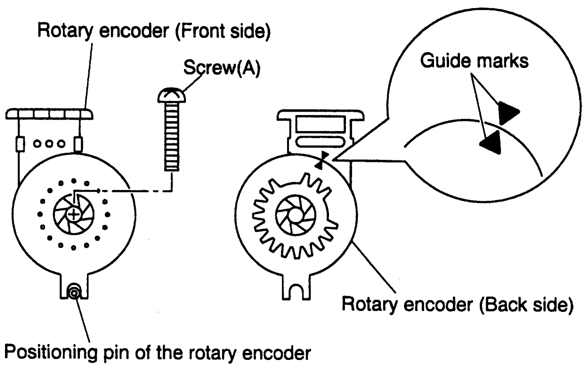

Rotary encoder (Front side)
Screw(A)
Guide marks
Rotary encoder (Back side)
Positioning pin of the rotary encoder

Fig. 2-2-20

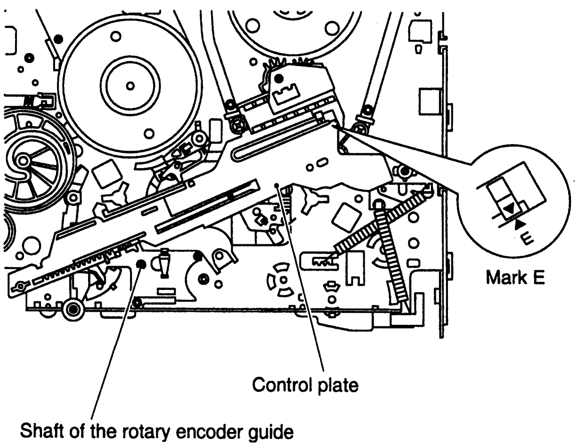

E
Mark E
Control plate
Shaft of the rotary encoder guide

Fig. 2-2-21

2. How to install (Phase matching)

(1) Make sure that the mark E of the control plate is in alignment with the mark ▼ of the loading arm gear shaft and bring the guide marks on the rotary encoder into alignment as indicated in Fig.2-2-20. (See Fig. 2-2-20 and Fig. 2-2-21.)

(2) Turn over the rotary encoder with its guide marks kept in alignment and install it by fitting on the shaft of the rotary encoder guide and the positioning pin.

(3) Tighten the screw (A) to complete the installation.

2.2.11 Clutch Unit

(1) Remove the belt wound around the capstan motor and the clutch unit.

(2) Remove the slit washer and remove the clutch unit.

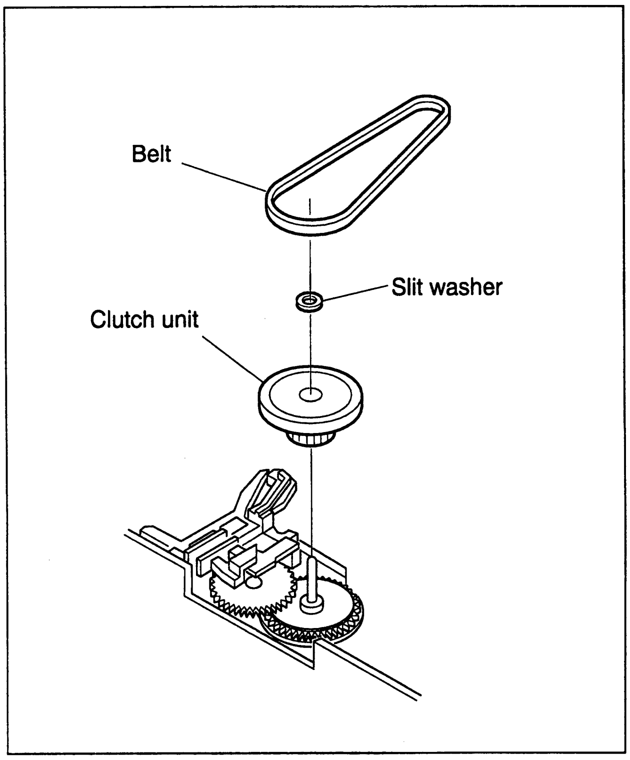

Belt
Slit washer
Clutch unit

Fig. 2-2-22

2.2.12 Change Lever Assembly, Direct Gear and Clutch Gear1

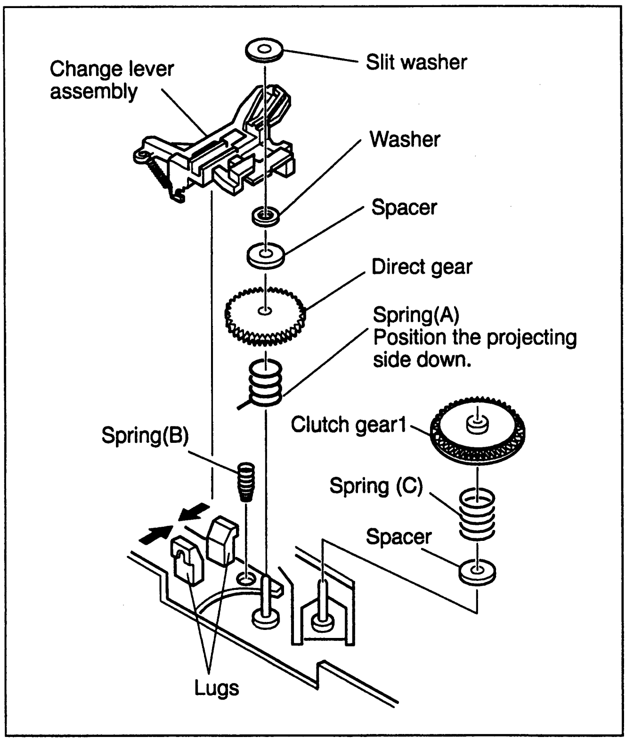

Change lever assembly
Slit washer
Washer
Spacer
Direct gear
Spring(A)
Position the projecting side down.
Spring(B)
Clutch gear1
Spring (C)
Spacer
Lugs

Fig. 2-2-23

1. How to remove

(1) Release the two lugs of the rotary encoder guide in the arrow-indicated direction and remove the change lever assembly.

(2) Remove the slit washer retaining the direct gear and remove the latter.
Take care so as not to lose the washer and spring. (See Fig.2-2-23.)

2. How to install

(1) Install the clutch gear1, spring (A), spring (C), direct gear, spacer and others to the individual shafts of the main deck, and finally the slit washer. (See Fig.2-2-23.)

(2) Let the spring (B) drops into the rotary encoder guide hole and install the change lever assembly.(Take care not to mistake a direction of the spring.) The point is to slightly lift the clutch gear1 and catch it from the both sides with the assembly. (See Fig.2-2-24.)

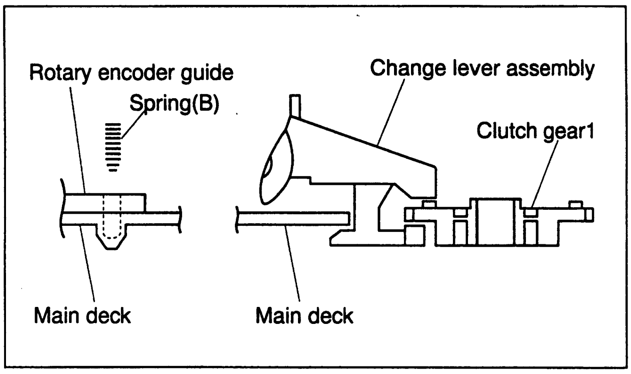

Rotary encoder guide
Spring(B)
Change lever assembly
Clutch gear1
Main deck
Main deck

Fig. 2-2-24

2.2.13 Link Lever

1. How to remove

(1) Remove the two slit washers.

(2) Remove the link lever by lifting it from the shaft retained by the slit washers. Then swing the link lever counterclockwise and remove it from the locking section of the control plate.

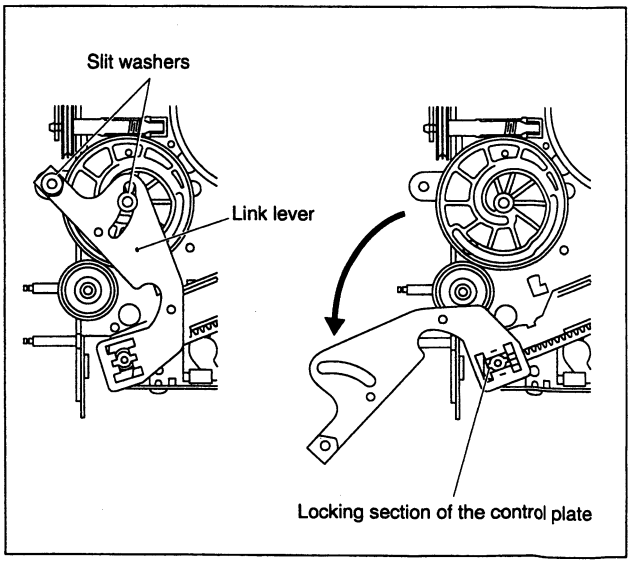

Slit washers
Link lever
Locking section of the control plate

Fig. 2-2-25

2. How to install (Phase matching)

(1) Slide the control plate so that its mark E is aligned with the mark ▼ on the loading arm gear shaft. (See Fig.2-2-26.)

(2) Rotate the worm gear until the guide hole of the control cam is aligned exactly with the guide hole of the main deck. (See Fig.2-2-27.)

(3) Insert the link lever into the locking section of the control plate. (See Fig.2-2-25.)

(4) Rotate the link lever clockwise so that it is installed on the shafts in the center and on the left of the control cam.

(5) Fasten the slit washers at these two points.

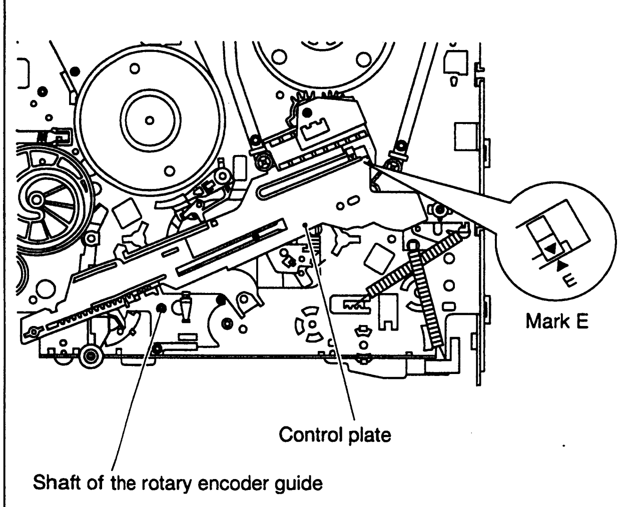

Mark E
E
Control plate
Shaft of the rotary encoder guide

Fig. 2-2-26

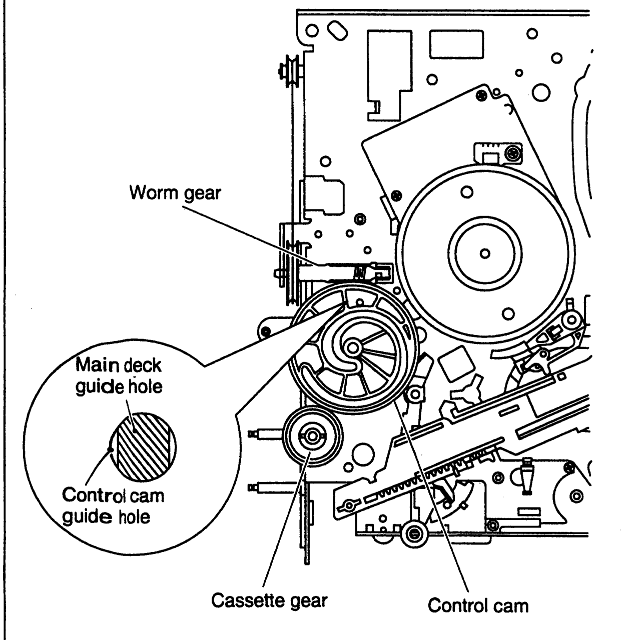

Worm gear
Main deck guide hole
Control cam guide hole
Cassette gear
Control cam

Fig. 2-2-27

2.2.14 Cassette Gear, Control Cam and Worm Gear

1. How to remove

(1) Remove the control cam by lifting it.

(2) Open the two lugs of the cassette gear outward and pull the latter off.

(3) Remove the belt wound around the worm gear and the loading motor.

(4) Open the lug of the lid guide outward and remove the worm gear.

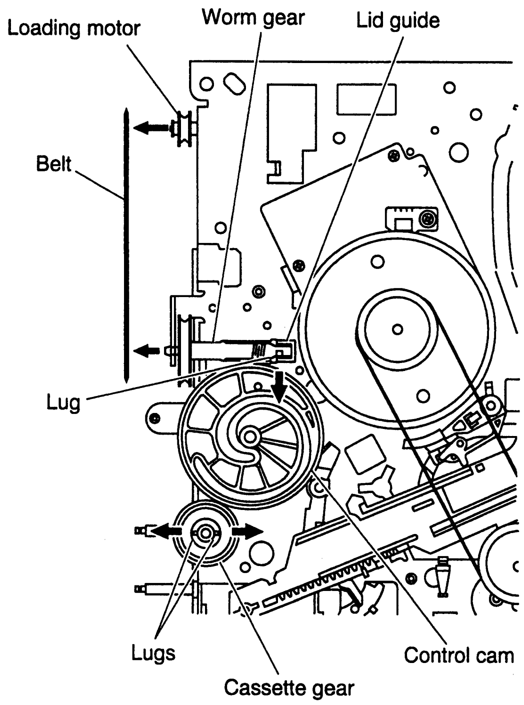

Loading motor
Worm gear
Lid guide
Belt
Lug
Lugs
Control cam
Cassette gear

Fig. 2-2-28

2.2.15 Control Plate

1. How to remove

(1) Remove the screw (A) retaining the control bracket 1 and remove the latter.

(2) Slide the control plate as indicated by the arrow and remove the control plate. (See Fig.2-2-29.)

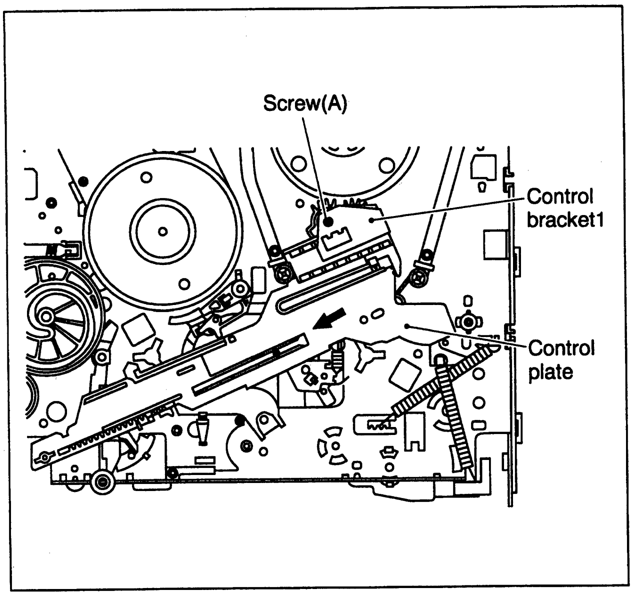

Screw(A)
Control bracket1
Control plate

Fig. 2-2-29

2. How to install (Phase matching)

(1) Adjust the position of the idler arm assembly pin as indicated in Fig.2-2-30 (to the left of center of the R section).

(2) Bring the guide hole of the take-up lever into alignment with the hole at the control plate guide and fix the position by inserting a 1.5 mm hexagonal wrench.

(3) Install the control plate so that the section A of the loading arm gear shaft fits into the hole (A) of the control plate, the section B of the control plate guide into the hole (B), and the control plate comes under the section C of the rotary encoder guide and the section D of the loading arm gear shaft while press-fit the pole base assmebly (supply side) as indicated by the arrow. It is important that the tension arm assembly shaft is positioned closer toward you than the control plate. (See Fig.2-2-31.)

(4) Make sure that the mark E of the control plate is in alignment with the mark ▼ of the loading arm gear shaft. (See Fig.2-2-31.)

(5) Pull off the hexagonal wrench for positioning.

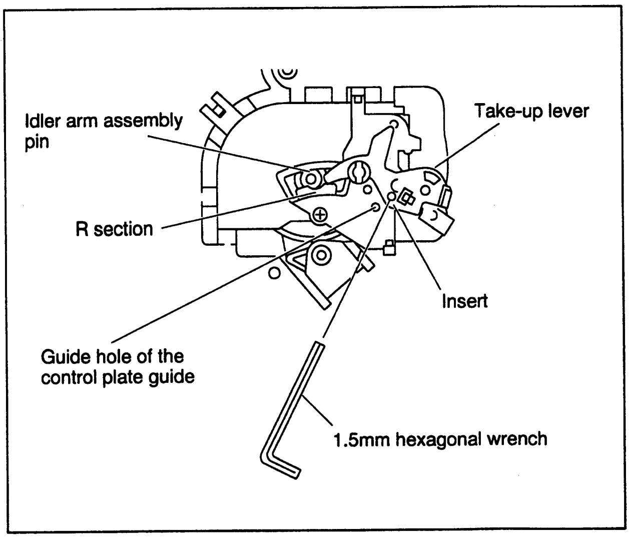

Idler arm assembly pin
Take-up lever
R section
Insert
Guide hole of the control plate guide
1.5mm hexagonal wrench

Fig. 2-2-30

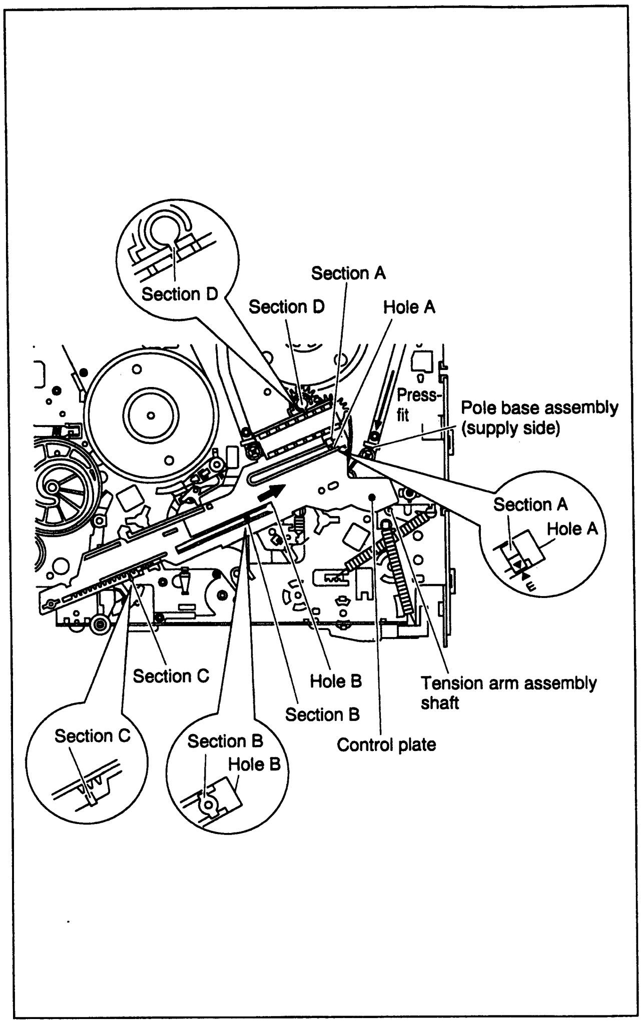

Section D
Section A
Section D
Hole A
Press-fit
Pole base assembly (supply side)
Section A
Hole A
E
Section C
Hole B
Section B
Tension arm assembly shaft
Control plate
Section C
Section B
Hole B

Fig. 2-2-31

2.2.16 Loading Arm Gear (supply or take-up side) and Loading Arm Gear Shaft

1. How to remove

(1) Remove the loading arm gear (supply side) by loosening the screw (A). (See Fig. 2-2-32.)

(2) Remove the screw (B) and remove the torsion arm from the pole base assembly (take-up side). (See Fig.2-2-32.)

(3) Turn the loading arm gear (take-up side) clockwise so that the notch of the loading arm gear (take-up side) is in alignment with the projection of the loading arm gear shaft and lift it.

Likewise, turn the loading arm counterclockwise so that the notch is in alignment with the projection and remove the loading arm gear (take-up side). (See Fig.2-2-32 and Fig. 2-2-33.)

(4) When removing the loading arm gear shaft, be sure of first removing the screw retaining the drum assembly (on the back side of the loading arm gear shaft). Then remove the screw (C) and remove the loading arm gear shaft by sliding it.

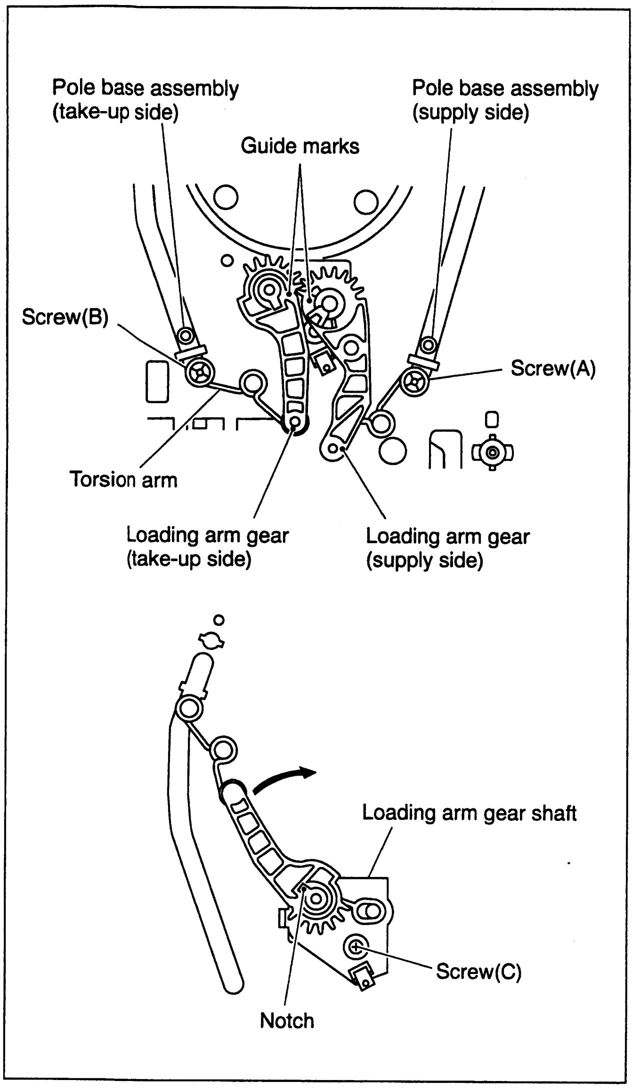

Pole base assembly (take-up side)
Pole base assembly (supply side)
Guide marks
Screw(B)
Screw(A)
Torsion arm
Loading arm gear (take-up side)
Loading arm gear (supply side)
Loading arm gear shaft
Screw(C)
Notch

Fig. 2-2-32

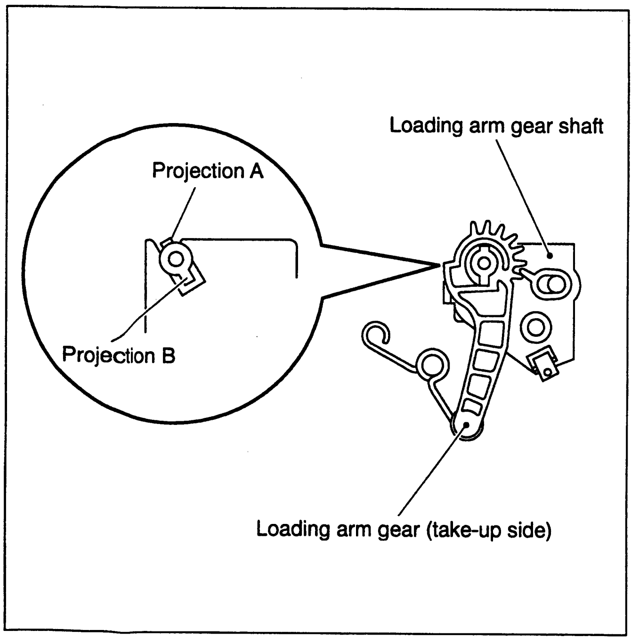

Loading arm gear shaft
Projection A
Projection B
Loading arm gear (take-up side)

Fig. 2-2-33

2. How to install

(1) Align the notch of the loading arm gear (take-up side) to the projection B of the loading arm gear shaft and slip it over. Then rotate it clockwise for alignment with the projection A and slip it down to the bottom. (See Fig.2-2-33.)

(2) Then turn the loading arm gear (take-up side) counterclockwise. Hang the torsion arm on the pole base assembly (take-up side) and tighten the screw (B).

(3) Install the loading arm gear (supply side) so that the guide mark of the loading arm gear (take-up side) is in alignment with the guide mark of the loading arm gear (supply side). Then hang the torsion arm on the pole base assembly (supply side) and tighten the screw (A). (See Fig.2-2-32.)

2.2.17 Take-up Lever, Take-up Head and Control Plate Guide

(1) Remove the spring of the take-up lever from the main deck.

(2) Remove the lug (A) of the take-up lever from the main deck and pull out the take-up lever and the take-up head together.

(3) Remove the screw (A).

(4) Align the idler arm assembly pin in the center of the R section of the control plate guide, remove the control plate guide lugs (B) and (C) from the main deck, and remove the control plate guide.

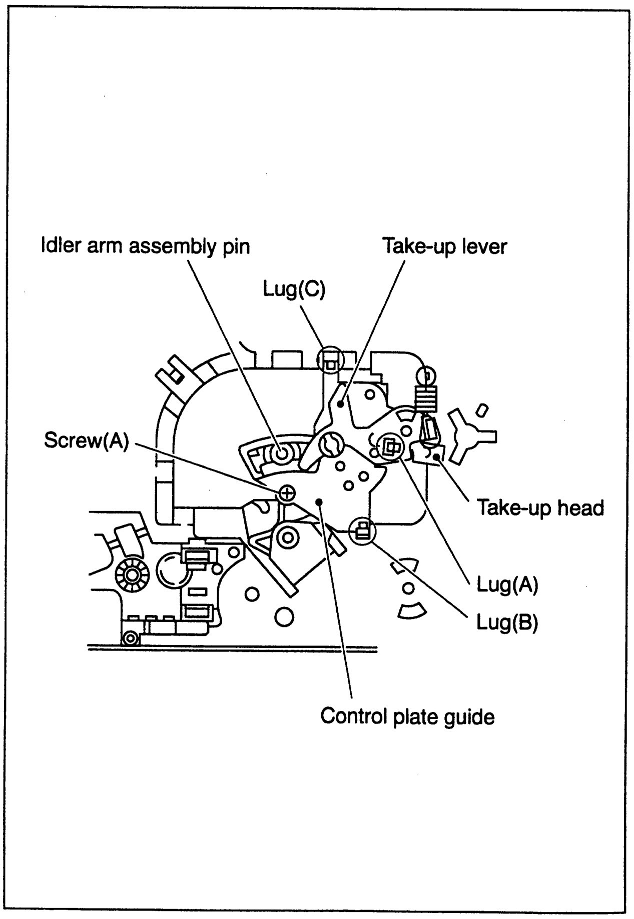

Idler arm assembly pin
Take-up lever
Lug(C)
Screw(A)
Take-up head
Lug(A)
Lug(B)
Control plate guide

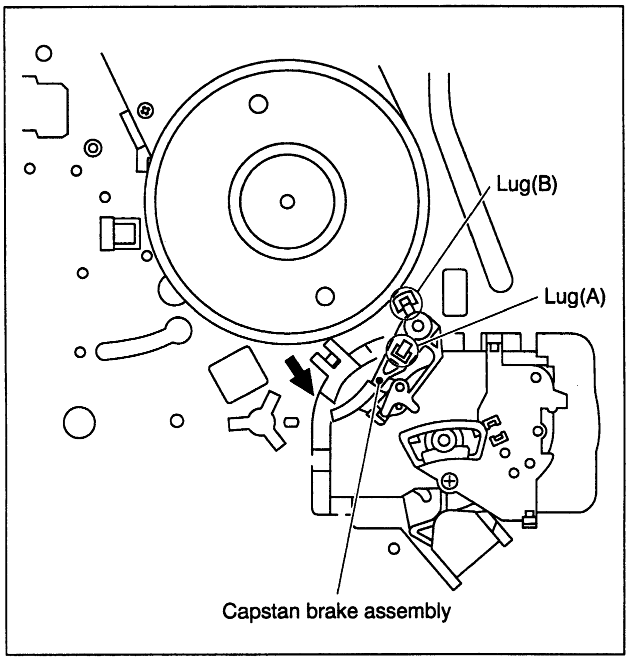
Fig. 2-2-34

2.2.18 Capstan Brake Assembly

1. How to remove

(1) Move the lug (A) of the capstan brake assembly in the arrow-indicated direction so that it comes into alignment with the notch of the main deck. (See Fig. 2-2-35.)

(2) Remove the lug (B) of the capstan brake assembly from the main deck and remove the capstan brake assembly.



Lug(B)
Lug(A)
Capstan brake assembly

Fig. 2-2-35

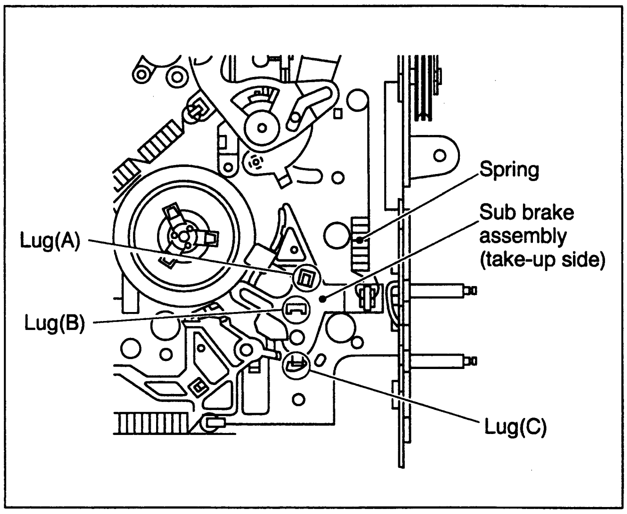
2.2.19 Sub Brake Assembly (take-up side)

1. How to remove

(1) Remove the spring attached to the lid guide and sub brake assembly (take-up side).

(2) Bring the lug (A) of the sub brake assembly (take-up side) into alignment with the notch of the main deck.

(3) Remove the lugs (B) and (C) of the sub brake assembly (take-up side) from the main deck and remove the sub brake assembly (take-up side).



Lug(A)
Lug(B)
Spring
Sub brake assembly (take-up side)
Lug(C)

Fig. 2-2-36

2.2.20 Main Brake Assembly (take-up side), Reel Disk (take-up side) and Main Brake Assembly (supply side)

1. How to remove

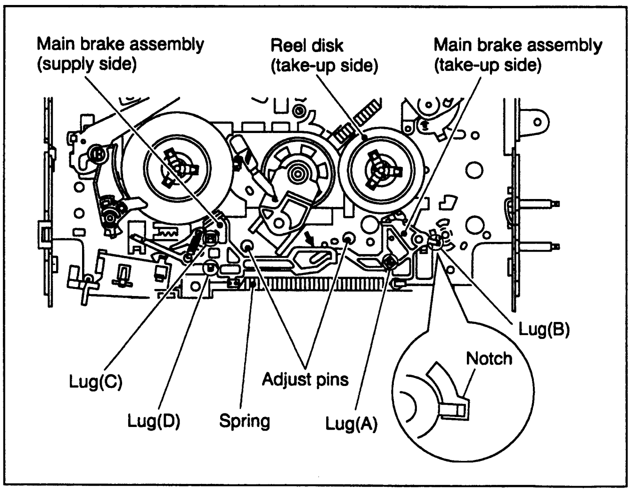
(1) Move the main brake assembly (take-up side) in the arrow-indicated direction and remove the reel disk (take-up side).

(2) Remove the spring attached to the main brake assembly.

(3) Remove the lug (A) of the main brake assembly (take-up side) and pull out the lug (B) after bringing it into alignment with the main deck notch.

(4) Remove the lugs (C), (D) and (E) of the main brake assembly (supply side) from the main deck and pull them off. (See Fig.2-2-37.)

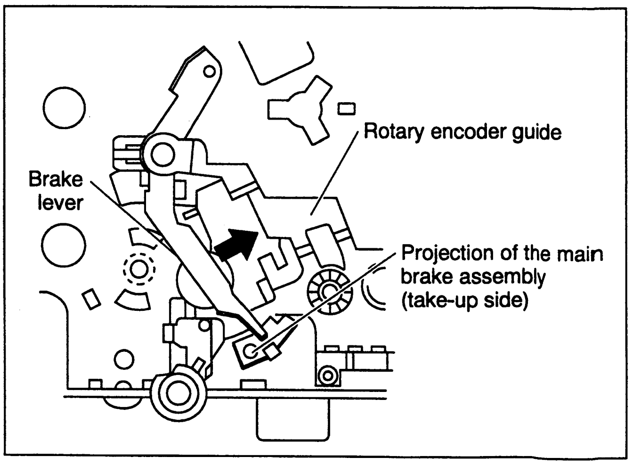
Note: *If the main brake assembly is difficult to remove, press it and hold the adjustment pin from the back side of the main deck when attempting to remove it.*
After the adjustment pin has been removed or the main brake assembly or the reel disk on the supply or take-up side have been replaced, it is required to adjust the main brake assembly torque. See page 2-23 for the detailed adjustment procedures.



Main brake assembly (supply side)
Reel disk (take-up side)
Main brake assembly (take-up side)
Lug(B)
Notch
Lug(C)
Adjust pins
Lug(D)
Spring
Lug(A)

Fig. 2-2-37

(5) When installing the main brake assembly (take-up side), slide the brake lever in the direction as indicated by the arrow to prevent it from hitting the projection of the main brake assembly (take-up side). (See Fig.2-2-38.)



Rotary encoder guide
Brake lever
Projection of the main brake assembly (take-up side)

Fig. 2-2-38

2.2.21 Tension Brake Assembly, Reel Disk (supply side) and Tension Arm Assembly

1. How to remove

(1) Remove the three lugs of the tension brake assembly from the main deck and pull them off.

(2) Remove the reel disk (supply side) by loosening in the arrow-indicated direction the main brake assembly (supply side).

(3) Remove the tension spring on the back of the main deck. Then release the lug of the tension arm bearing in the arrow-indicated direction and draw out the tension arm assembly. (See Fig. 2-2-39.)

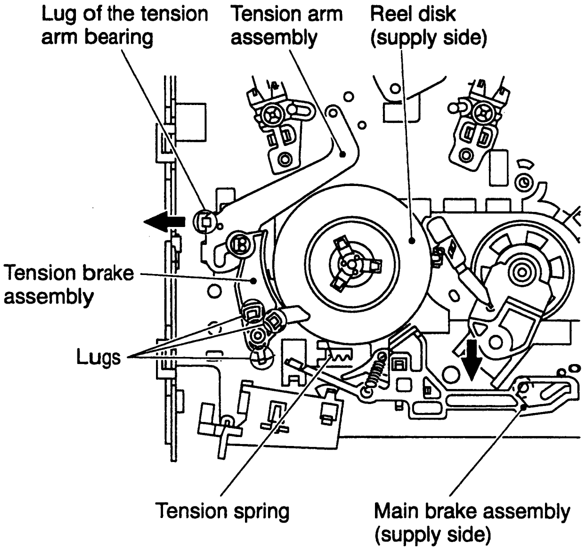

Lug of the tension arm bearing
Tension arm assembly
Reel disk (supply side)
Tension brake assembly
Lugs
Tension spring
Main brake assembly (supply side)

Fig. 2-2-39

2.2.22 Idler Lever, Idler Arm Assembly

1. How to remove

(1) Remove the lug of the idler lever from the main deck and remove the hook fitted in the idler arm assembly hole by lifting it.

(2) Remove the slit washer and pull out the idler arm assembly.

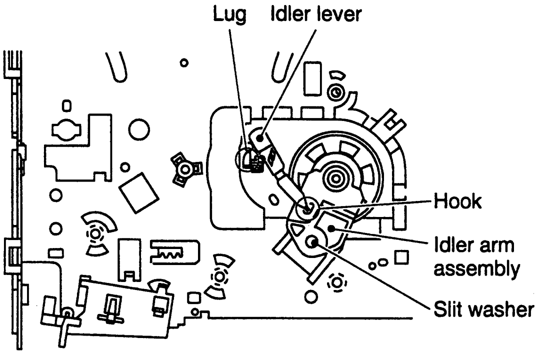

Lug
Idler lever
Hook
Idler arm assembly
Slit washer

Fig. 2-2-40

2.2.23 Stator Assembly

(1) Remove the flat cable.

(2) Remove the two screws (A).

(3) Remove the stator assembly by lifting in the arrow-indicated direction. (Take care that the brush spring does not jump out.)

(4) After installation, be sure to perform the PB switching point adjustment according to the electrical adjustment procedure.

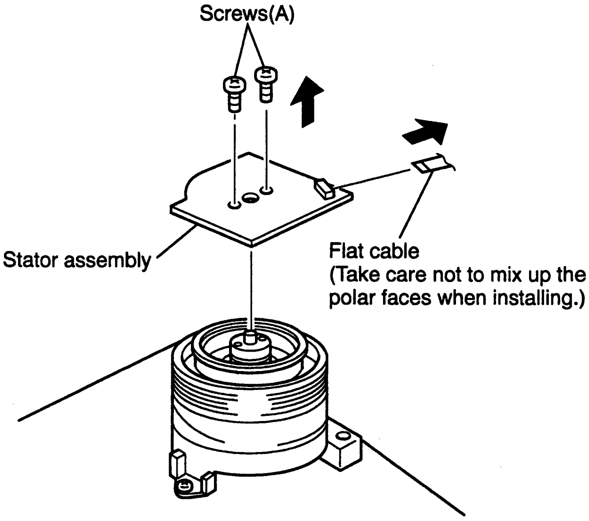

Screws(A)
Stator assembly
Flat cable
(Take care not to mix up the polar faces when installing.)

Fig. 2-2-41

2.2.24 Rotor Assembly

(1) Remove the stator assembly.
(2) Remove the two screws (B) and remove the rotor assembly.

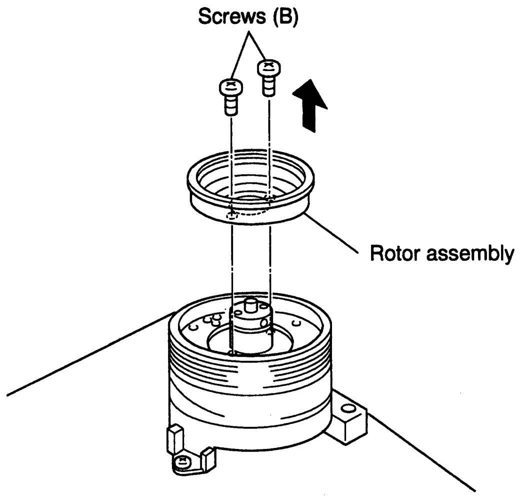

Screws (B)
Rotor assembly

Fig. 2-2-42

Note: *When installing the rotor assembly, note that a normal picture cannot be obtained without ensuring the phase matching as mentioned below.*

(3) Match the phases of the upper drum assembly and the rotor assembly as indicated in Fig.2-2-43.
(4) Place the upper drum assembly hole (a) over the rotor assembly holes (b) (with three holes to be aligned) and tighten the two screws (B). (See Fig.2-2-43.)

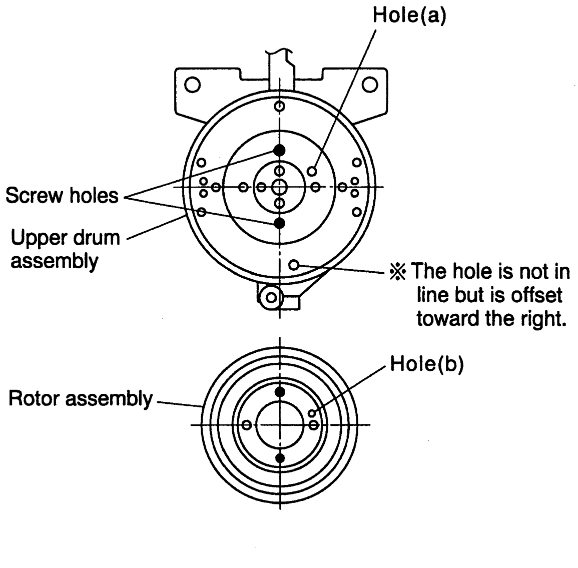

Hole(a)
Screw holes
Upper drum assembly
※The hole is not in line but is offset toward the right.
Hole(b)
Rotor assembly

Fig. 2-2-43

2.2.25 Upper Drum Assembly

1. How to remove

(1) Remove the stator assembly and rotor assembly.
(2) Loosen the screw of the collar assembly using a 1.5 mm hexagonal wrench and remove the collar assembly. Also remove the brush, spring and cap at one time.
(3) Remove the upper drum assembly and remove the washer using tweezers.

Note: *When replacement is required, control the up-down movement of the brush. Never apply grease.*

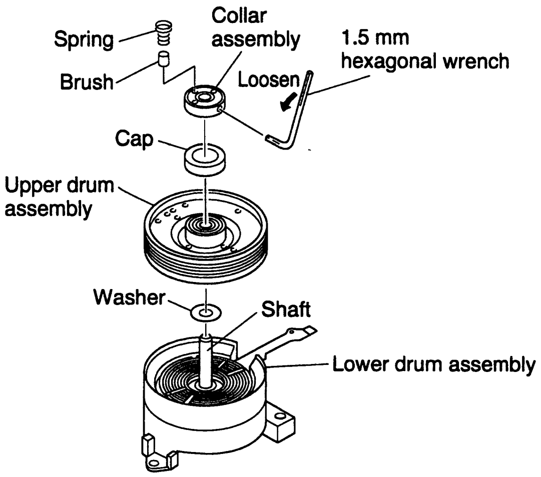

Spring
Collar assembly
1.5 mm hexagonal wrench
Brush
Loosen
Cap
Upper drum assembly
Washer
Shaft
Lower drum assembly

Fig. 2-2-44

2. How to install

(1) Clean the coil parts of the lower drum assembly and the newly installed upper drum assembly with an air brush in advance. (See Fig.2-2-45.)
(2) Install a new washer and upper drum assembly on the drum shaft. (See Fig.2-2-44.)

Note: *When replacing the upper drum assembly, replace it the together with the washer.*

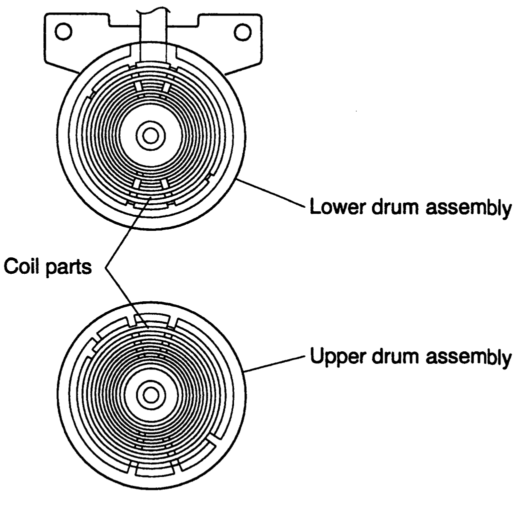

Lower drum assembly
Coil parts
Upper drum assembly

Fig. 2-2-45

(3) Install the cap to the upper drum assembly.

(4) Position the collar assembly as indicated in Fig.2-2-46 while controlling its up- down movement.

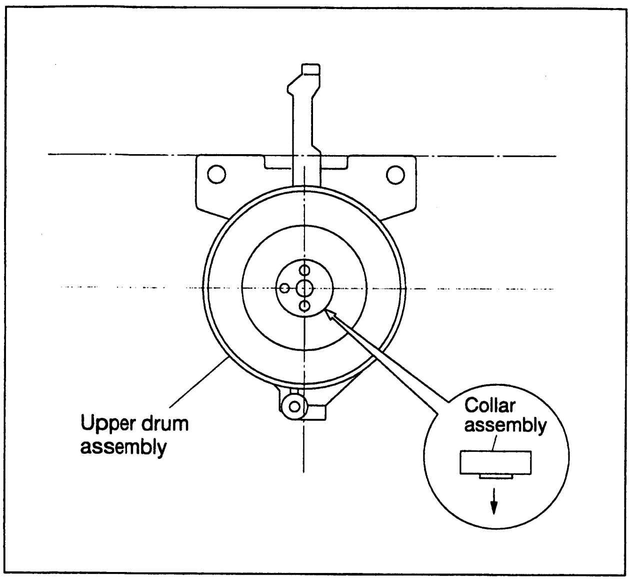


Fig. 2-2-46

(5) Secure the collar assembly in position with a hexagonal wrench while pressing its top with the fingers.

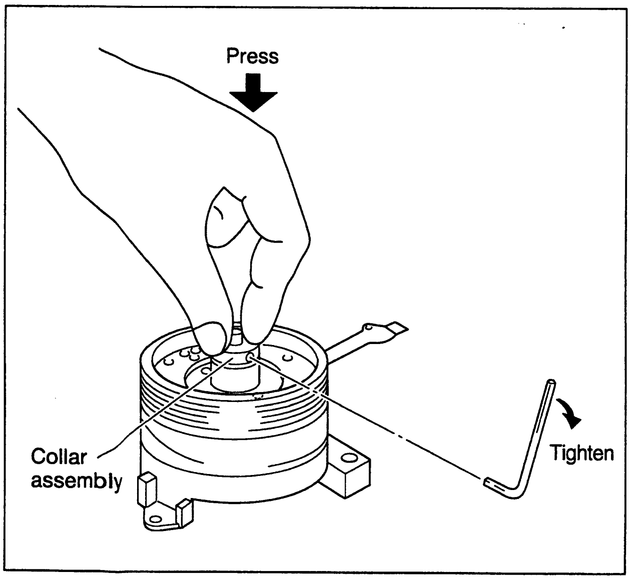


Fig. 2-2-47

(6) After installation, gently turn the upper drum assembly with your hand to make sure that it turns normally. Then install the brush and the spring.

(7) Install the rotor assembly and stator assembly according to Fig 2-2-41 and 2-2-42.

(8) When installation is complete, clean the upper drum assembly and lower drum assembly and carry out the following adjustments.

- PB switching point adjustment
- Slow tracking adjustment
- Compatibility adjustment (Be sure to check for compatibility for the EP mode.)

2.3 COMPATIBILITY ADJUSTMENT

Notes:
- *Although compatibility adjustment is very important, it is not necessary to perform this as part of the normal servicing work. It will be required when you have replaced the audio control head, drum assembly or any part of the tape transport system.*
- *To avoid any damage to the alignment tape while performing the compatibility adjustment, get a separate cassette tape (for recording and play back) ready to be used for checking the initial tape running behavior.*

2.3.1 Checking/Adjustment of FM Waveform Linearity

(1) Connect the oscilloscope to TP106(PB FM/COL) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.

(2) Playing the alignment tape MHP, observe the FM waveform.

(3) Press the channel buttons (+, –) simultaneously during playback to enter the manual tracking mode. (This also brings tracking to the center.)

(4) Make sure that there is no significant level drop of the FM waveform caused by the tracking operation, with its generally parallel and linear variation ensured. Perform the following adjustments when required. (See Fig.2-3-1.)

(5) Reduce the FM waveform while pressing the channel buttons (+, –) during playback. If a drop in level is found on the left side, turn the guide roller of the pole base assembly (supply side) with the roller driver (PTU94002) to make the FM waveform linear.
If a drop in level is on the right side, likewise turn the guide roller of the pole base assembly (take-up side) with the guide roller to make it linear. (See Fig.2-3-3.)

(6) Then play MHP-L and make sure that the FM waveform varies in parallel and linearly with the tracking operation. When required, perform fine-adjustment of the guide roller of the pole base assembly (supply or take-up side).

(7) Unload the cassette tape once, play the alignment tape MHP-L again and confirm the FM waveform.

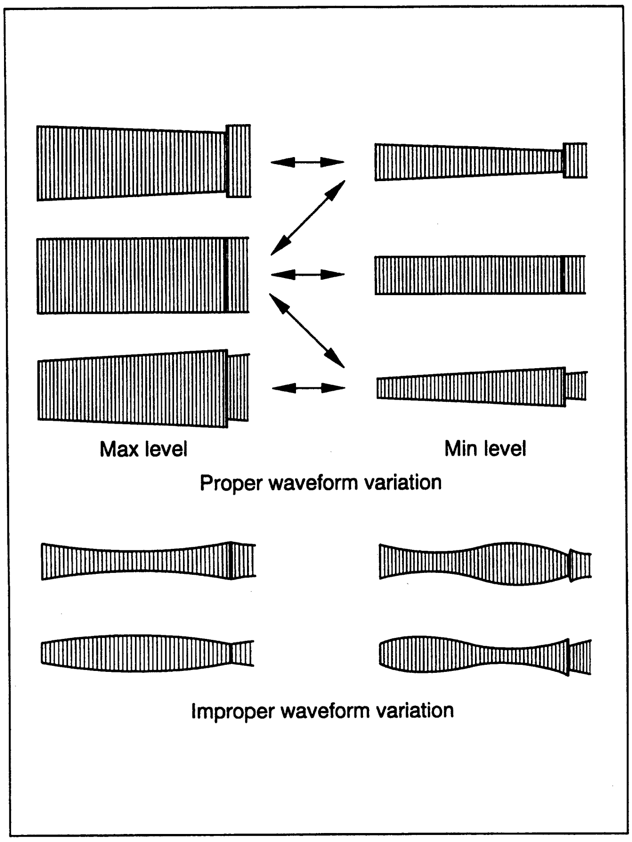

Max level
Min level
Proper waveform variation
Improper waveform variation

Fig. 2-3-1

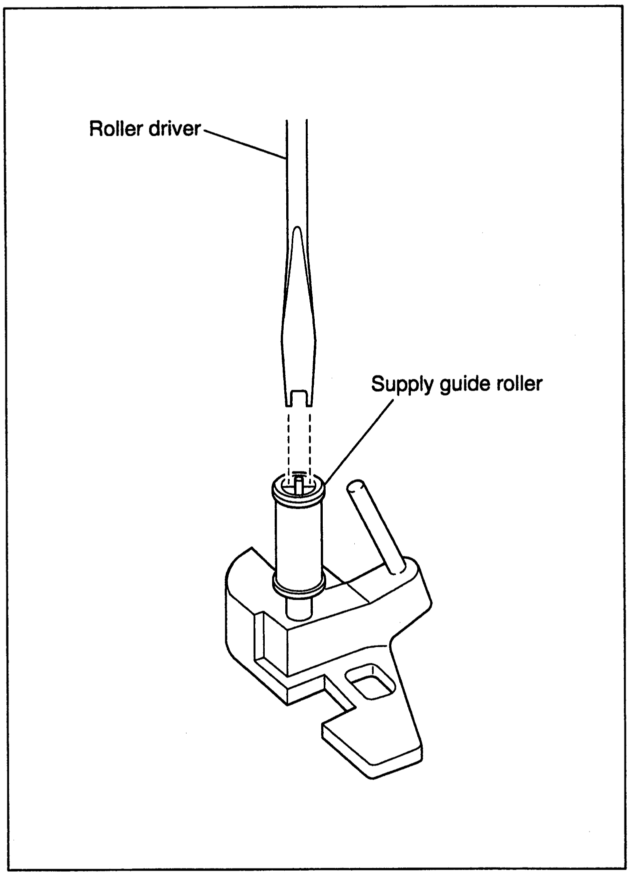

Roller driver
Supply guide roller

Fig. 2-3-2

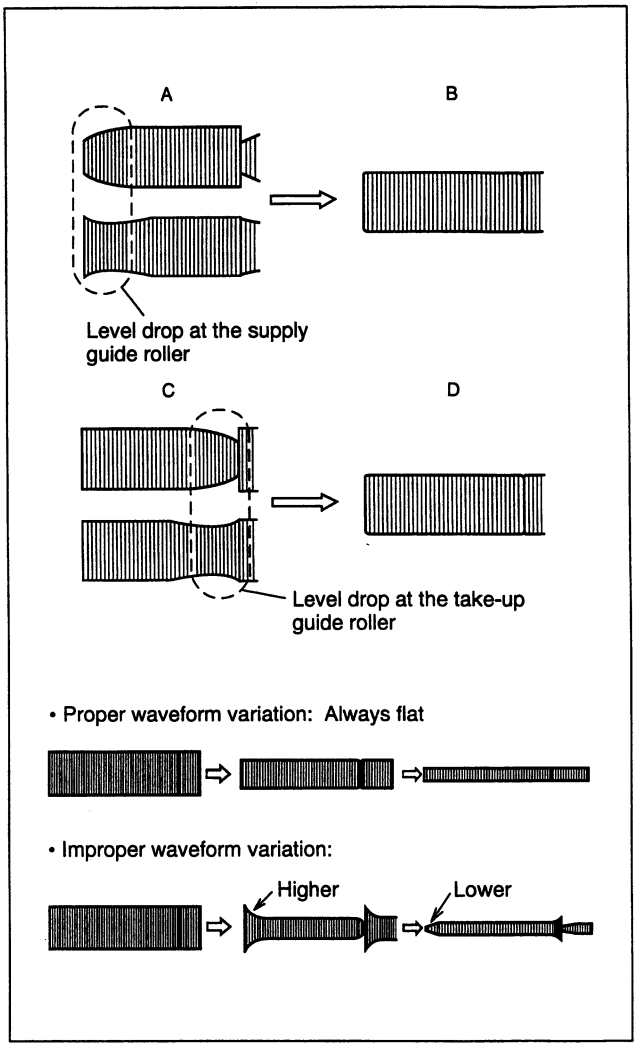

A
B
Level drop at the supply guide roller
C
D
Level drop at the take-up guide roller
• Proper waveform variation: Always flat
• Improper waveform variation:
Higher
Lower

Fig. 2-3-3

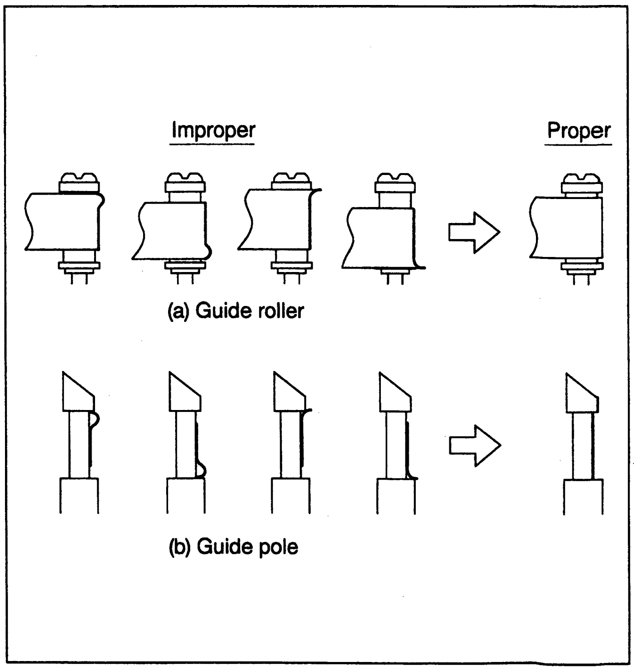

Improper
Proper
(a) Guide roller
(b) Guide pole

Fig. 2-3-4

2.3.2 Checking/Adjustment of the Height and Tilt of the Audio Control Head

Note: ***Set a temporary level of the height of the A/C head in advance to make the adjustment easier after the A/C head has been replaced. (See Fig.2-2-15.)***

(1) Connect CH-1 of the oscilloscope to AUDIO OUT and CH-2 to TP4001 (CTL P) of the main board assembly and observe the waveforms on both channels in the ALT mode.
(2) Play the alignment tape MHP and adjust it by turning the screws (1), (2) and (3) little by little until the waveform of both the audio output signal and the control pulse reach maximum. The screw (1) and screw (3) are for adjustment of tilt and screw (2) for azimuth.

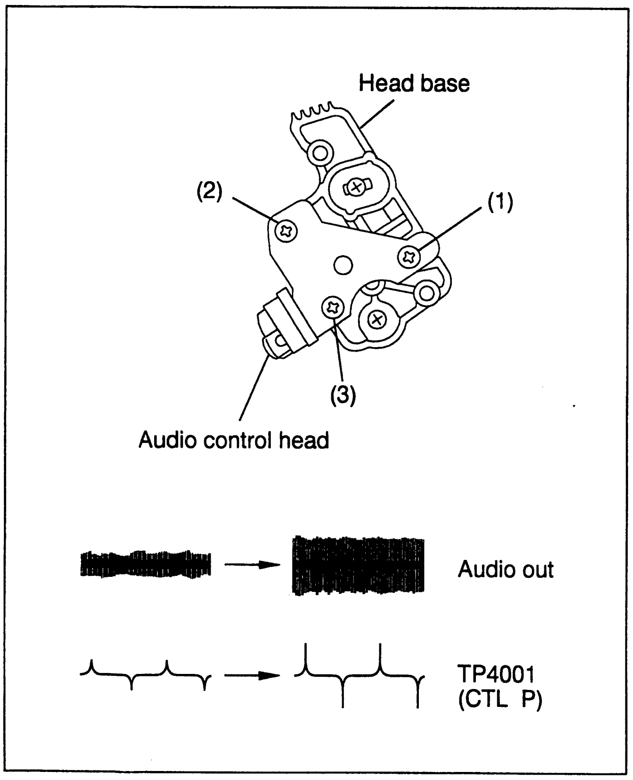


Fig. 2-3-5

2.3.3 Checking/Adjustment of the Audio Control Head Phase (X-Value)

(1) Connect the oscilloscope to TP106(PB FM/COL) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.
(2) Play the alignment tape MHP and observe the FM waveforms.
(3) Press the channel buttons (+, –) simultaneously during playback to enter the manual tracking mode. (This also brings tracking to the center.)
(4) Loosen screws (4) and (5) so that the A/C head position bit (PTU94010) is set as indicated in Fig.2-3-6.
(5) Turn the A/C head position bit fully toward the capstan. Then turn it back gradually toward the drum and stop on the second peak point position of the FM waveform output level. Then tighten the screw (4) temporarily.
(6) Then play the alignment tape MHP-L.
(7) Press the channel buttons (+, –) simultaneously during playback to enter the manual tracking mode. (This also brings the tracking to the center.)
(8) Perform the tracking operation and make sure that the FM waveform is at its maximum.
(9) If it is not at maximum, loosen the temporarily tightened the screw (4) and turn the A/C head position bit to bring the audio control head to a position, around where the waveform reaches its maximum for the first time. Then tighten the screws (4) and (5).

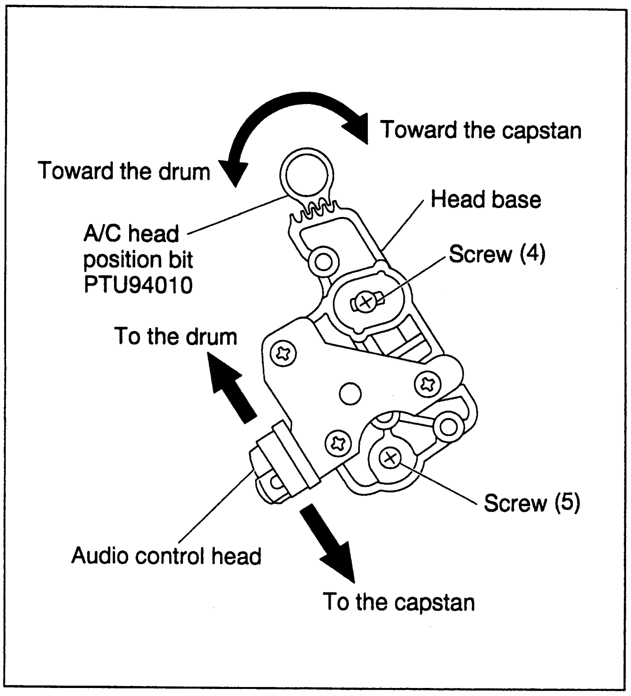


Fig. 2-3-6

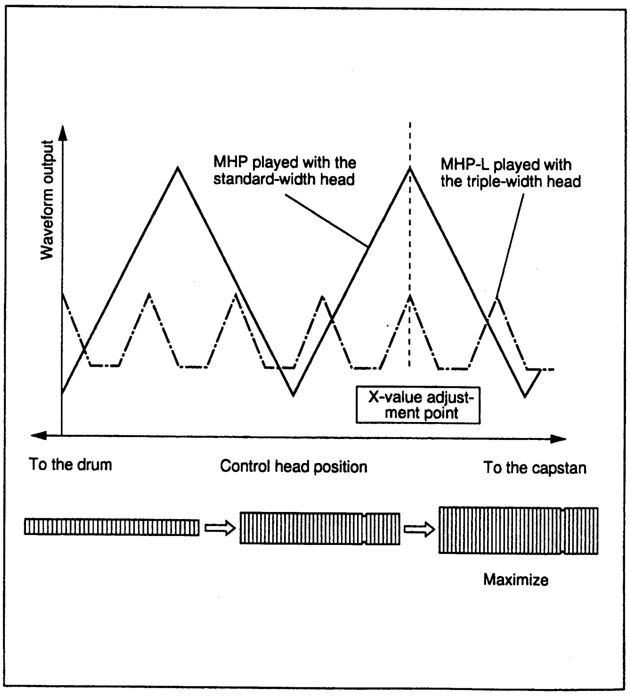


Fig. 2-3-7

2.3.4 Checking/Adjustment the Standard Tracking Preset

Note: *Set the remote control cable of the video recorder to A mode.*
(The unit set in B mode does not accept the remote control cable of the presetting unit.)

(1) Connect the oscilloscope to TP106(PB FM/COL) of the main board assembly and to TP111(D.FF) of the main board assembly for external sync connection.
(2) Playing the alignment tape MHP-L and observing the FM waveform, make sure that the auto tracking operation is complete.
(3) Press the button "D" of the presetting unit twice.
(4) Make sure that the MHP-L is not ejected.
(5) If ejected, again perform the phase (X-value) adjustment of the audio control head.

2.3.5 Checking/Adjustment of the Tension Pole

(1) Check the back tension cassette gauge (PUJ48076-2) to make sure that the indicator points to 25 - 51 gf•cm.
(2) If the indicated value is outside this range, carry out the following adjustment steps.
  1) Select the mechanism servicing mode. (See 1.5 MECHANISM SERVICE MODE.)
  2) While in the Play mode, turn the adjustment pin with a straight-slot screwdriver while taking care not to touch the 2.5 mm dia. pole. (See Fig.2-3-8.)

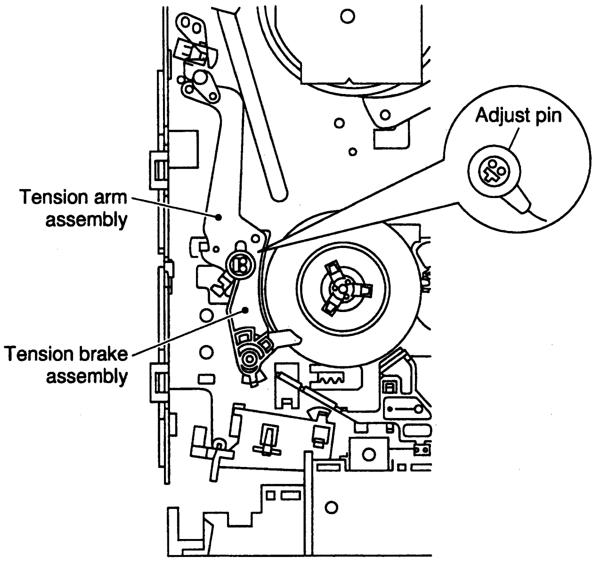


Fig. 2-3-8

2.3.6 Adjustment of the Tension Stud

(1) Adjust so that the left side of the tension stud is on the extension of the notch line of the main deck. (See Fig. 2-3-9.)

Note: *Adjustment is not usually necessary for the tension stud. Perform this adjustment only when it is out of position.*

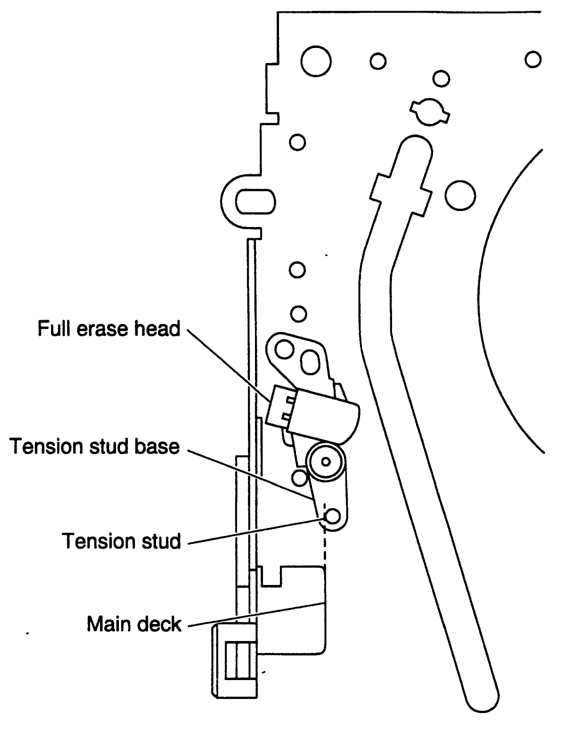


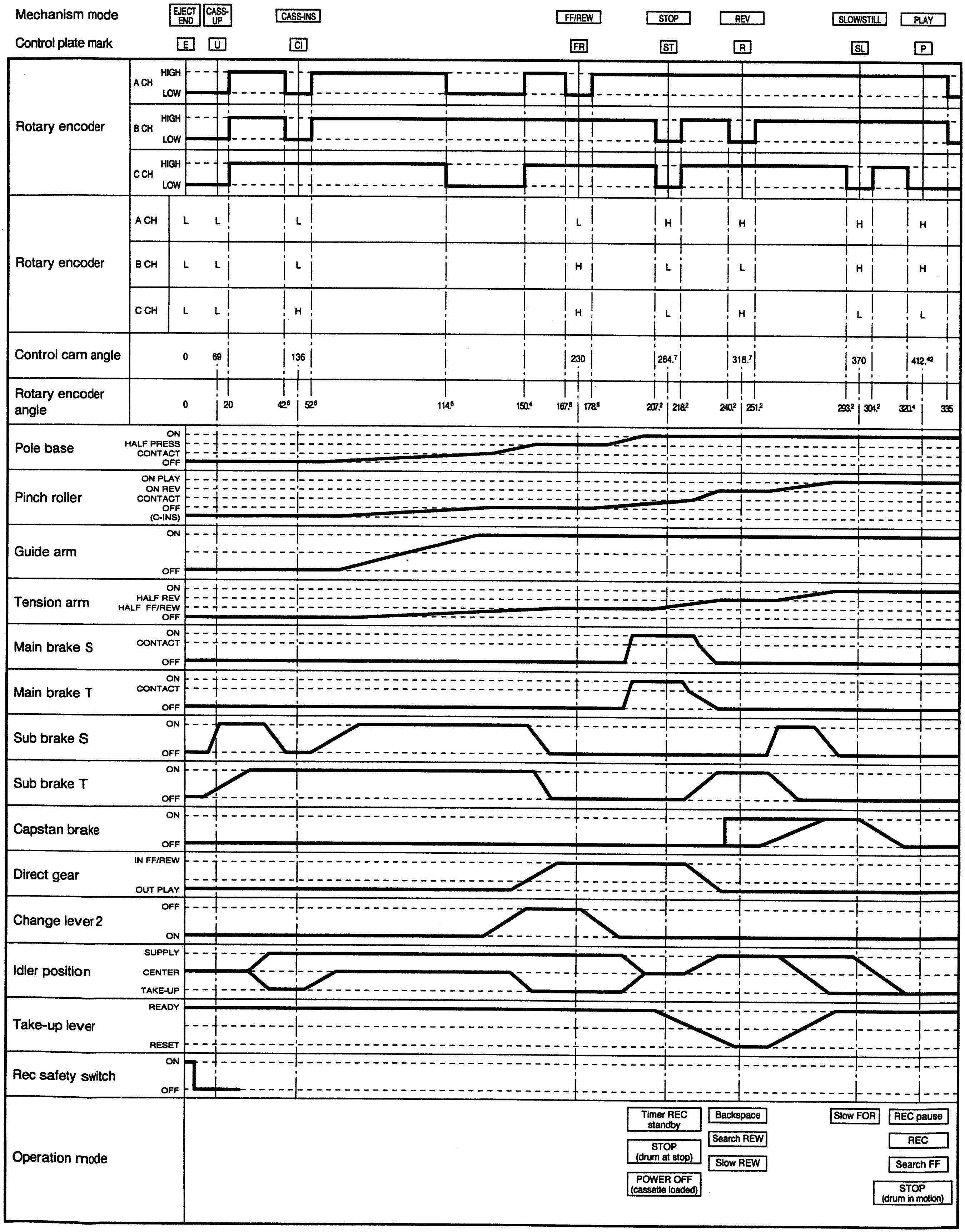
Fig. 2-3-9

2.3.7 Main Brake Torque Adjustment

Note: ***Adjustment of the main brake torque is required after the adjustment pin has been removed or the main brake assembly or the reel disk on the supply or take-up side have been replaced, removed or attached.***

(1) Rotate the pulley of the loading motor by hand to align the mark ▼ on the loading arm gear shaft with the ST marking on the control plate (i.e. set to the STOP mode position).
(2) Insert a torque gauge (PUJ48075-2) into the reel disk on the side to be played, hold the torque gauge lightly, rotate it clockwise when measuring the supply side torque or counterclockwise when measuring the take-up side torque, and read the value indicated at the moment the reel disk starts to slip.
(3) Make sure that the main brake torque values on the supply and take-up sides are both between $23.^{5}$ — $78.^{4}$ x 10^{-3} N•m (240 — 800 gf•cm). If the value is outside the specified range, adjust to the specified value by rotating the adjustment pin.
If an adjustment by using the adjustment pin is not possible, replace the main brake assembly.

Mechanism Timing Chart


Mechanism mode
EJECT END
CASS-UP
CASS-INS
FF/REW
STOP
REV
SLOW/STILL
PLAY
Control plate mark
E
U
CI
FR
ST
R
SL
P
Rotary encoder
A CH
B CH
C CH
HIGH
LOW
L
H
Control cam angle
0
69
136
230
264.7
318.7
370
412.42
Rotary encoder angle
0
20
42.6
52.6
114.6
150.4
167.8
178.8
207.2
218.2
240.2
251.2
293.2
304.2
320.4
335
Pole base
ON
HALF PRESS
CONTACT
OFF
Pinch roller
ON PLAY
ON REV
CONTACT
OFF
(C-INS)
Guide arm
ON
OFF
Tension arm
ON
HALF REV
HALF FF/REW
OFF
Main brake S
ON
CONTACT
OFF
Main brake T
ON
CONTACT
OFF
Sub brake S
ON
OFF
Sub brake T
ON
OFF
Capstan brake
ON
OFF
Direct gear
IN FF/REW
OUT PLAY
Change lever 2
OFF
ON
Idler position
SUPPLY
CENTER
TAKE-UP
Take-up lever
READY
RESET
Rec safety switch
ON
OFF
Operation mode
Timer REC standby
STOP (drum at stop)
POWER OFF (cassette loaded)
Backspace
Search REW
Slow REW
Slow FOR
REC pause
REC
Search FF
STOP (drum in motion)

SECTION 3
ELECTRICAL ADJUSTMENT

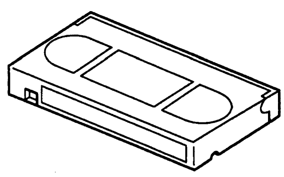
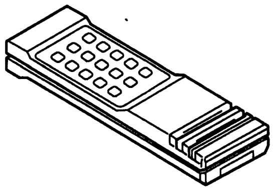
3.1 PRECAUTION

Electrical adjustment are required after replacing circuit components and certain mechanical parts. It is important to perform these adjustments only after all repairs and replacements have been completed. Also do not attempt these adjustments unless the proper equipments is available.

3.1.1 Required test equipment

① Color television or monitor
② Oscilloscope: wide-band,dual-trace,triggered delayed sweep
③ Frequency counter
④ Digital voltmeter
⑤ Signal generator: RF/IF sweep/marker
⑥ Signal generator: NTSC color bar, stairstep
⑦ Recording tape
⑧ Digit-key remote controller(provided)

3.1.2 Required adjustment tools

Alignment tape (SP,stairstep) MHP	Presetting unit PTU94008
	

3.1.3 Color bar signal,color bar pattern

- Color bar signal

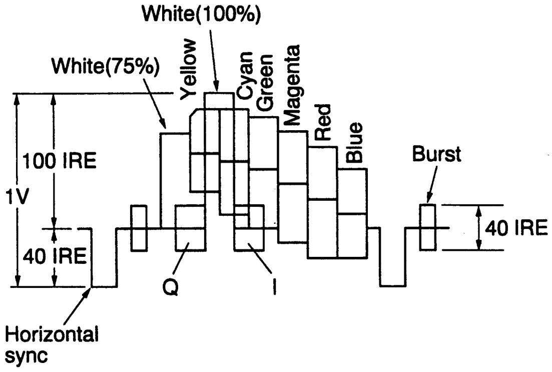

White(100%)
White(75%)
Yellow
Cyan
Green
Magenta
Red
Blue
Burst
100 IRE
1V
40 IRE
40 IRE
Q
I
Horizontal sync

Fig. 3-1-1 Color bar signal waveform

- Color bar pattern

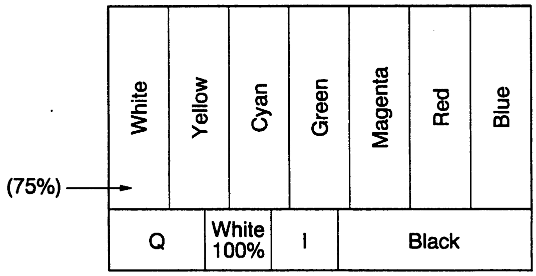

White
Yellow
Cyan
Green
Magenta
Red
Blue
(75%)
Q
White 100%
I
Black

Fig. 3-1-2 Color bar pattern

Note:

The system control circuit of this model has an automatic recognition about the ON-OFF control of the ***DOCTOR SYSTEM.***

3.2 SERVO CIRCUIT

Notes: • *Unless otherwise specified,all measurement point and adjustment parts are located on the MAIN BOARD.*
• *Set VCR to the mode A by remote controller.*

3.2.1 PB switching point

Signal	• Alignment tape [MHP],Stairstep
Mode	• PB,Automatic tracking OFF
Equipment	• Oscilloscope
Measurement point	• VIDEO OUT TERMINAL
Trigger slope (–)	• TP111(DRUM FF)
Adjustment tool	• Presetting unit [PTU94008]
Specification	• 6.5 ± 0.5H

(1) Connect an oscilloscope to VIDEO OUT TERMINAL and external trigger from TP111 (negative slope).
(2) Playback the stairstep signal of the alignment tape.
(3) Press the "O" button of the presetting unit.
The adjustment is performed automatically. Once the adjustment is performed, the VCR will go into the STOP mode.
(4) Playback the alignment tape again, confirm the switching point (See Fig.3-2-2).

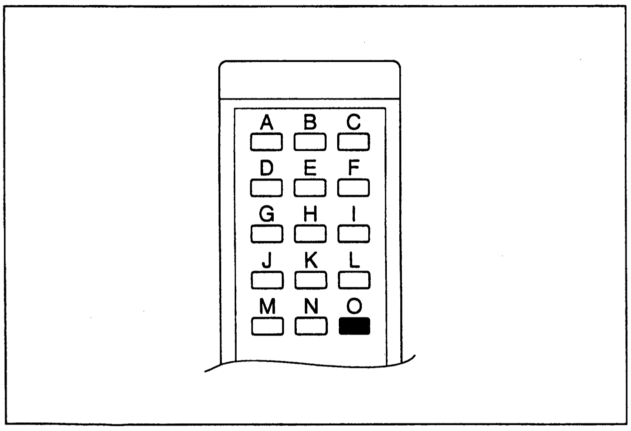


Fig. 3-2-1 Presetting unit

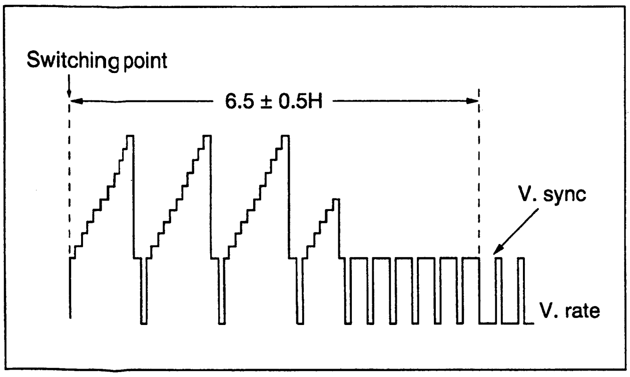


Fig. 3-2-2 PB switching point

3.2.2 Slow tracking preset

Signal	• Tuner or color bar
Mode	• SP/EP, REC → PB(SLOW) Automatic tracking OFF
Equipment	• TV-Monitor
Adjustment tool	• Presetting unit [PTU94008]
Specification	• Minimum noise

Note : *Set VCR to the mode A by remote controller. Use only buttons "B" and "C", depressing other buttons during adjustment may cause adjustment errors.*

(1) Record a color bar signal in the SP mode.
(2) Playback recorded signal on the FWD slow mode.
(3) Set the tracking control to the center position by simultaneously pressing the CH "▲" and "▼" buttons.
(4) Observe the display on the TV monitor and adjust for optimum noise condition (best tracking) by depressing "B " or "C " buttons of the presetting unit.
(5) Depress the STOP button.
(6) Confirm that the bar noise is not visible on the TV monitor in the slow mode.
(7) Repeat steps (2) to (6) in REV slow mode.
(8) Repeat steps (1) to (7) in EP mode.

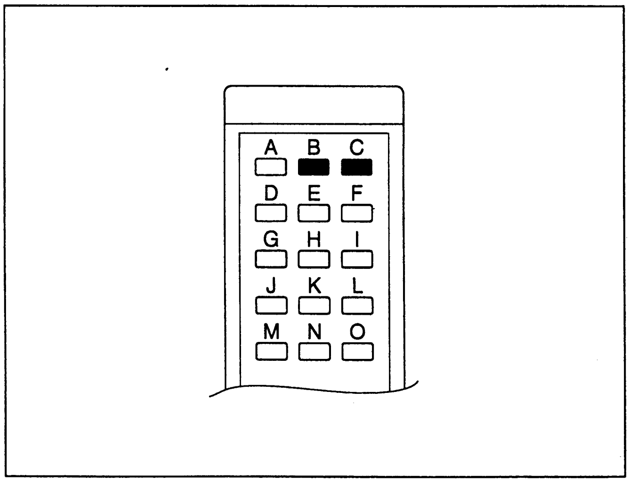


Fig. 3-2-3 Presetting unit

3.3 DEMODULATOR CIRCUIT

Notes:
- *Unless otherwise specified,all measurement point and adjustment parts are located on the MAIN BOARD.*
- *DEMODULATOR circuit adjustments are performed by the EVR system by use of the presetting unit and digit-key remote controller.*
- *Unless otherwise specified,set an audio multiplex TV signal generator as follows; RF signal : 70 dbu / 75 ,color bar 87.5% modulation.*
- *Set VCR to the mode A by remote controller.*

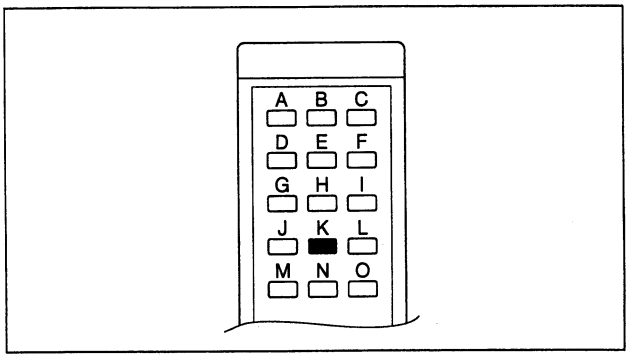


Fig. 3-3-1 Presetting unit

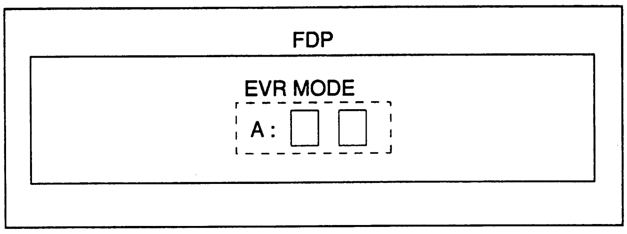


Fig. 3-3-2 EVR mode

3.3.1 Input level

Signal	• RF signal
Mode	• EE Tuner
Equipment	• Audio level meter
Measurement point	• IC6501- pin 26
Adjustment tool	• Presetting unit [PTU94008], Digit-key remote controller
EVR mode	• A : 20
Specification	• 500 ± 10 mVrms

(1) Connect an audio level meter to IC6501- pin 26.
(2) Set EVR mode by pressing "K" button of the presetting unit more than 2 seconds.
(3) Set "A : 20" pressing 2 and 0 digit keys of the remote controller.
(4) Set a signal generator mode to mono 300Hz.
(5) Adjust CH " ▲ " or " ▼ " button for 500 ± 10 mVrms.
(6) Set normal VCR mode by pressing "K" button of the presetting unit again so adjustment data is memorized.

3.3.2 Stereo VCO

Signal	• No signal
Mode	• EE Tuner
Equipment	• Frequency counter
Measurement point	• IC6501- pin 26
Adjustment tool	• Presetting unit [PTU94008], Digit-key remote controller
EVR mode	• A : 21
Specification	• 15.73 ± 0.1 KHz

(1) Connect a frequency counter to IC6501- pin 26.
(2) Set EVR mode by pressing "K" button of the presetting unit more than 2 seconds.
(3) Set "A : 21" pressing 2 and 1digit keys of the remote controller.
(4) Adjust CH " ▲ " or " ▼ " button for 15.73 ± 0.1 KHz.
(5) Set normal VCR mode by pressing "K" button of the presetting unit again so adjustment data is memorized.

3.3.3 Stereo filter

Signal	• RF signal
Mode	• EE Tuner
Equipment	• Oscilloscope
Measurement point	• IC6501- pin 26
Adjustment tool	• Presetting unit [PTU94008], Digit-key remote controller
EVR mode	• A : 22
Specification	• Minimum level

(1) Connect an oscilloscope to IC6501- pin 26.
(2) Set EVR mode by pressing "K" button of the presetting unit more than 2 seconds.
(3) Set "A : 22" pressing 2digit key twice of the remote controller.
(4) Adjust CH " ▲ " or " ▼ " button for minimum level.
(5) Set normal VCR mode by pressing "K" button of the presetting unit again so adjustment data is memorized.

3.3.4 Separation - 1

Signal	• RF signal
Mode	• EE Tuner
Equipment	• Audio level meter
Measurement point	• IC6501- pin 27
Adjustment tool	• Presetting unit [PTU94008], Digit-key remote controller
EVR mode	• A : 23
Specification	• Minimum level

(1) Connect an audio level meter to IC6501- pin 27.
(2) Set EVR mode by pressing "K" button of the presetting unit more than 2 seconds.
(3) Set "A : 23" pressing 2 and 3 digit keys of the remote controller.
(4) Set a signal generator mode to alternate L-ch 300Hz 14% modulated.
(5) Adjust CH " ▲ " or " ▼ " button for minimum level.
(6) Set normal VCR mode by pressing "K" button of the presetting unit again so adjustment data is memorized.

3.3.5 Separation - 2

Signal	• RF signal
Mode	• EE Tuner
Equipment	• Audio level meter
Measurement point	• IC6501- pin 27
Adjustment tool	• Presetting unit [PTU94008], Digit-key remote controller
EVR mode	• A : 24
Specification	• Minimum level

(1) Connect an audio level meter to IC6501- pin 27.
(2) Set EVR mode by pressing "K" button of the presetting unit more than 2 seconds.
(3) Set "A : 24" pressing 2 and 4 digit keys of the remote controller.
(4) Set a signal generator mode to alternate L-ch 5 KHz 14% modulated.
(5) Adjust CH " ▲ " or " ▼ " button for minimum level.
(6) Set normal VCR mode by pressing "K" button of the presetting unit again so adjustment data is memorized.

3.3.6 SAP VCO

Signal	• No signal
Mode	• EE Tuner
Equipment	• Frequency counter
Measurement point	• IC6501- pin 26
Adjustment tool	• Presetting unit [PTU94008], Digit-key remote controller
EVR mode	• A : 25
Specification	• 78.67 ± 0.5 KHz

(1) Connect a frequency counter to IC6501- pin 26.
(2) Set EVR mode by pressing "K" button of the presetting unit more than 2 seconds.
(3) Set "A : 25" pressing 2 and 5 digit keys of the remote controller.
(4) Adjust CH " ▲ " or " ▼ " button for 78.67 ± 0.5 KHz.
(5) Set normal VCR mode by pressing "K" button of the presetting unit again so adjustment data is memorized.

3.4 VIDEO CIRCUIT

Notes: • *Unless otherwise specified, all measurement point and adjustment parts are located on the MAIN BOARD.*
• *Set VCR to the mode A by remote controller.*

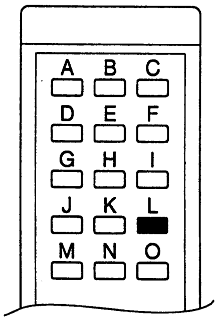


Fig. 3-4-1 Presetting unit

3.4.1 Auto picture

Signal	• Monoscope
Mode	• Auto picture : OFF • Video Calibration : OFF • REC then PB • SP/EP
Adjustment tool	• Presetting unit[PTU94008]
Specification	• STOP mode

(1) Record a monoscope signal in the SP mode.
(2) Playback the recorded signal.
(3) Press the "L" button of the presetting unit during playback.
(4) Confirm that VCR will go into the STOP mode.
(5) Repeat steps (2) to (4) in the EP mode.

SECTION 4
CHARTS AND DIAGRAMS

NOTES OF SCHEMATIC DIAGRAM

Safety precautions
The Components identified by the symbol ⚠ are critical for safety. For continued safety, replace safety critical components only with manufacturer's recommended parts.

1. Units of components on the schematic diagram

Unless otherwise specified.

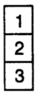
1) All resistance values are in ohm, 1/6 W, 1/8 W (refer to parts list).
   Chip resistors are 1/16 W.
   K: KΩ (1000Ω), M: MΩ (1000KΩ)
2) All capacitance values are in μF, (P: PF).
3) All inductance values are in μH, (m: mH).
4) All diodes are 1SS133, MA165 or 1N4148M (refer to parts list).

2. Indications of control voltage

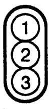
AUX : Active at high

$\overline{\text{AUX}}$ or AUX(L) : Active at low

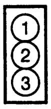
3. Interpreting Connector indications



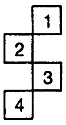
Removable connector



Wire soldered directly on board



Non-removable Board connector



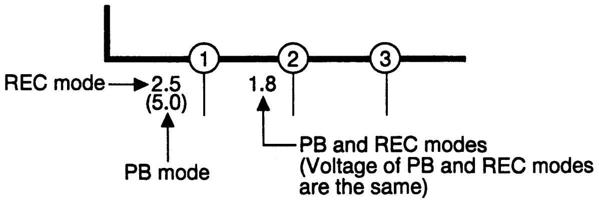
Board to Board

→
←
↔

Connected pattern on board
The arrows indicate signal path

4. Voltage measurement

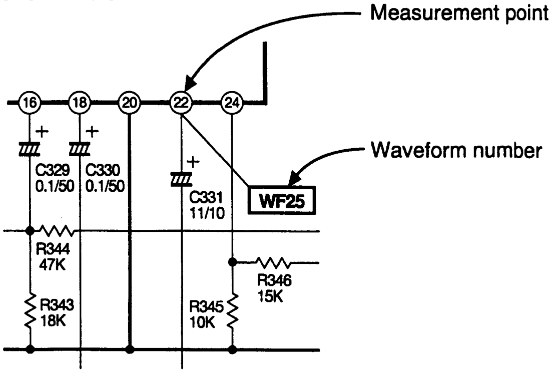
1) Video circuits
   REC : Colour bar signal in SP mode, normal VHS mode
   PB : Alignment tape, colour bar SP mode, normal VHS mode
   — : Unmeasurable or unnecessary to measure
2) Audio circuits
   REC : 1KHz, –8 dBs sine wave signal in SP mode, Normal VHS mode
   PB : REC then playback it
3) Movie Camera circuits
   Measured using a correctly illuminated gray scale or colour bar test charts in the E-E mode
4) Indication on schematic diagram
   Voltage Indications for REC and PB mode on the schematic diagram are as shown below.


①
②
③
REC mode
2.5
(5.0)
1.8
PB mode
PB and REC modes
(Voltage of PB and REC modes are the same)

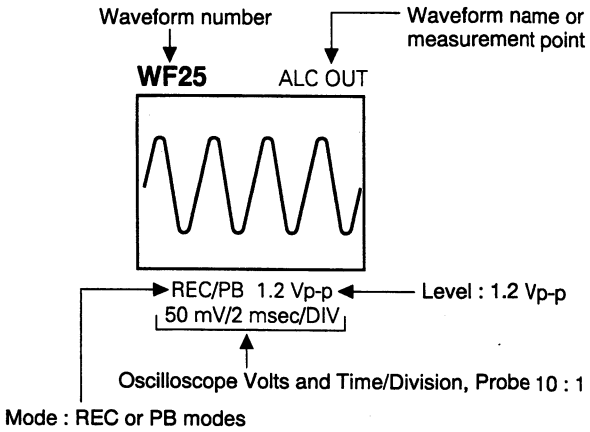
Note: If the voltages are not indicated on the schematic diagram, refer to the voltage charts.

5. Waveform measurement

1) Video circuits
   REC : Colour bar signal in SP mode, normal VHS mode
   PB : Alignment tape, colour bar SP mode, normal VHS mode
2) Audio circuits
   REC : 1KHz, –8 dBs sine wave signal in SP mode, normal VHS mode
   PB : REC then playback it
3) Movie Camera circuits
   Measured using a correctly illuminated gray scale or colour bar test chatrs in the E-E mode
4) Indication on schematic diagram
   Waveform indications on the schematic diagram are as shown below.


Measurement point
⑯
⑱
⑳
㉒
㉔
Waveform number
C329
0.1/50
C330
0.1/50
C331
11/10
WF25
R344
47K
R346
15K
R343
18K
R345
10K

5) Waveform indications


Waveform number
Waveform name or measurement point
WF25
ALC OUT
REC/PB 1.2 Vp-p
Level : 1.2 Vp-p
50 mV/2 msec/DIV
Oscilloscope Volts and Time/Division, Probe 10 : 1
Mode : REC or PB modes

6. Signal path Symbols

The arrows indicate the signal path as follows.

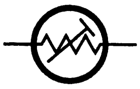
⇨	Playback signal path
▭▶	Playback and recording signal path
➡	Recording signal path (including E-E signal path)
⇨▷	Capstan servo path
➡▶	Drum servo path

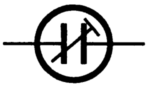
(Example)

⇨ R-Y	Playback R-Y signal path
➡ Y	Recording Y signal path

7. Indication of the parts for adjustments

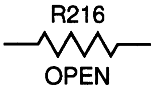
The parts for the adjustments are surrounded with the circle as shown below.





8. Indication of the parts not mounted on the circuit board

"OPEN" is indicated by the parts not mounted on the circuit board.



CIRCUIT BOARD NOTES

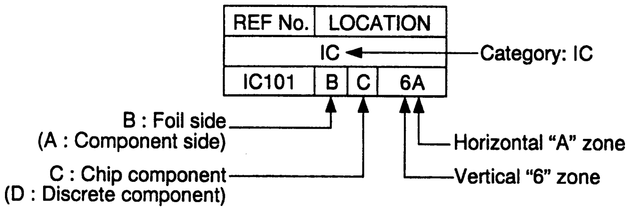
1. Foil and Component sides

1) Foil side (B side) :
Parts on the foil side seen from foil face (pattern face) are indicated.

2) Component side (A side) :
Parts on the component side seen from component face (parts face) indicated.

2. Parts location guides

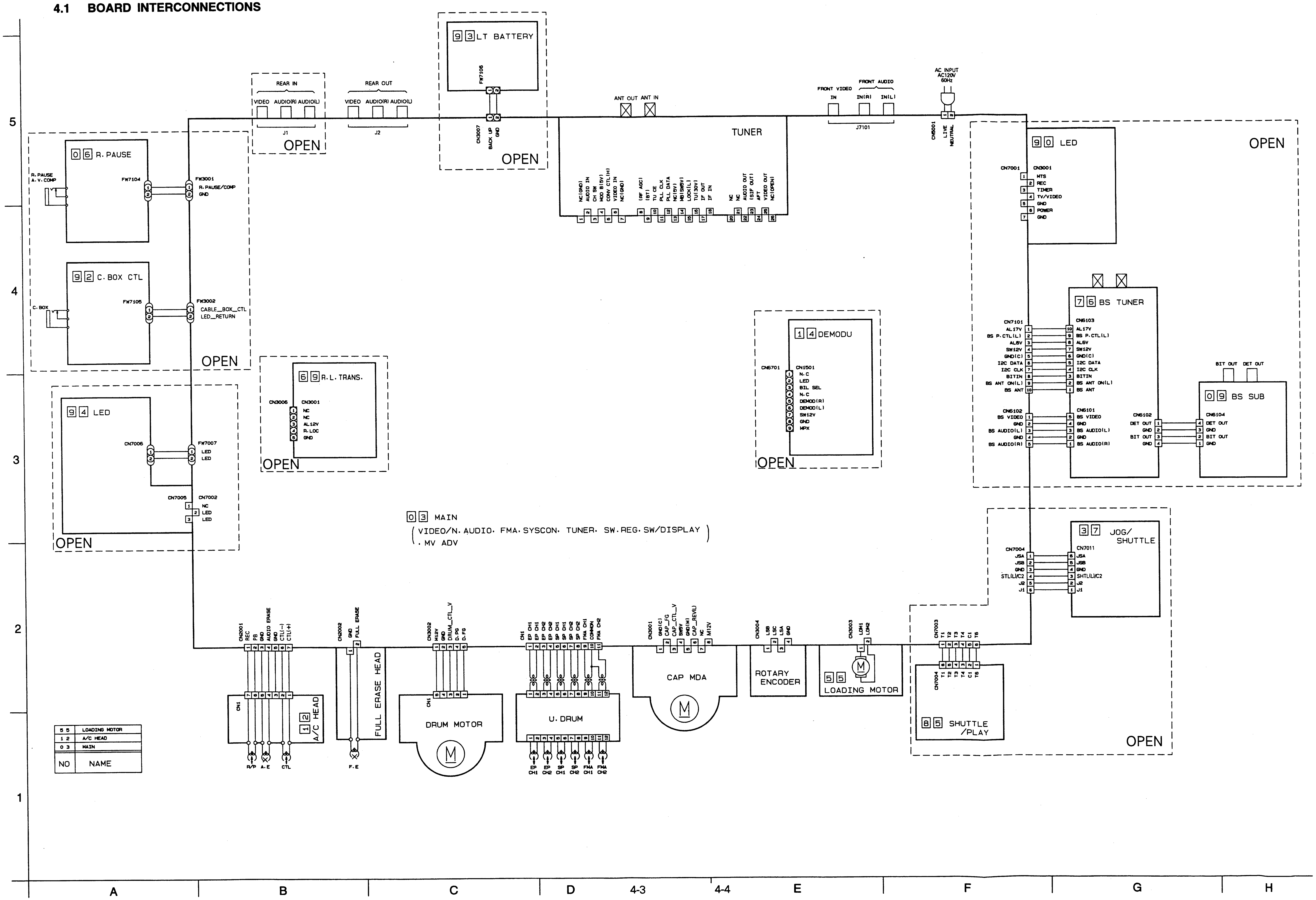
Parts location are indicated by guide scale on the circuit board.


REF No.
LOCATION
IC
Category: IC
IC101
B
C
6A
B : Foil side
(A : Component side)
C : Chip component
(D : Discrete component)
Horizontal "A" zone
Vertical "6" zone

Note:

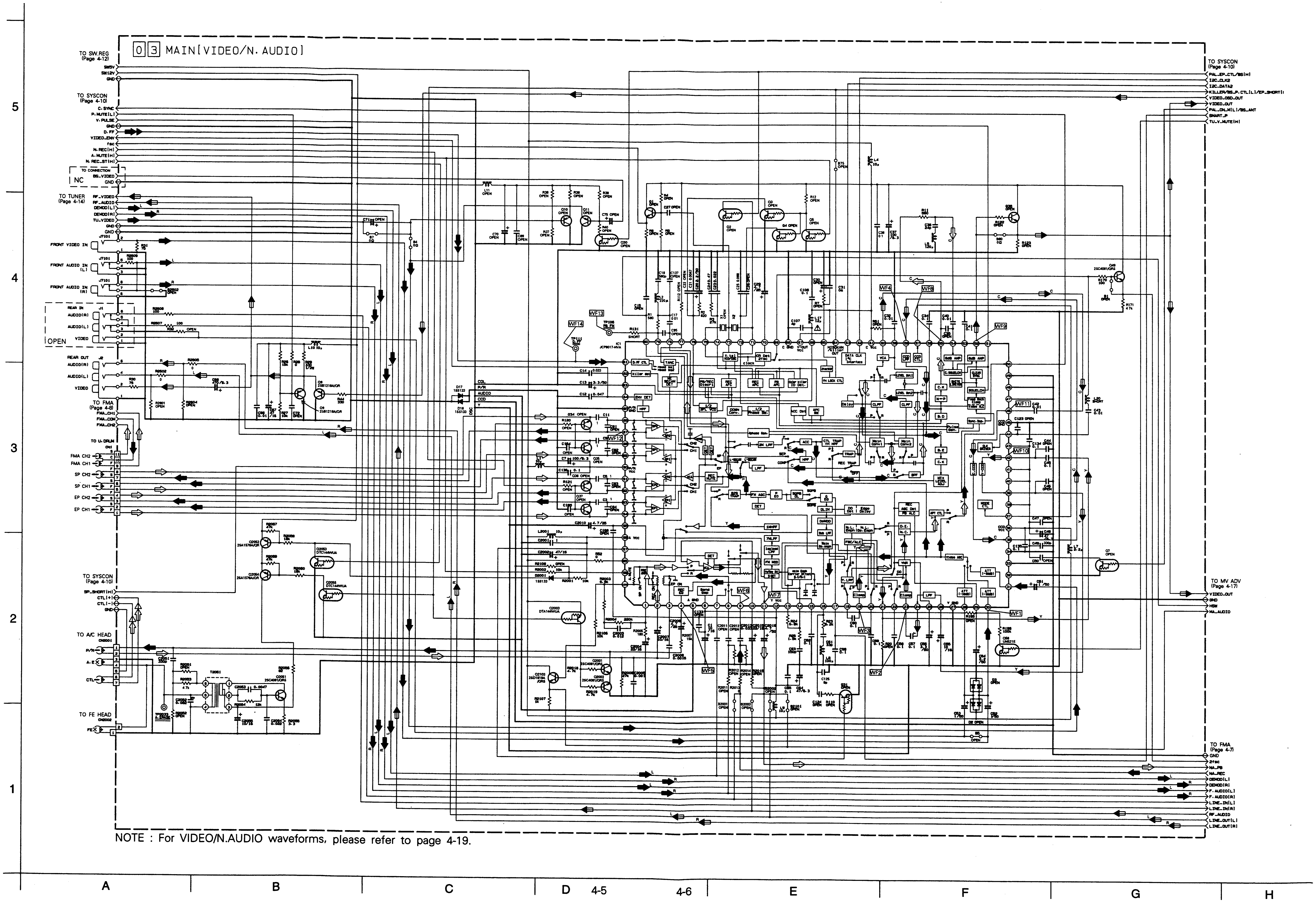
For general information in service manual, please refer to the Service Manual of GENERAL INFORMATION Edition 4 No. 82054D (January 1994).

4.1 BOARD INTERCONNECTIONS



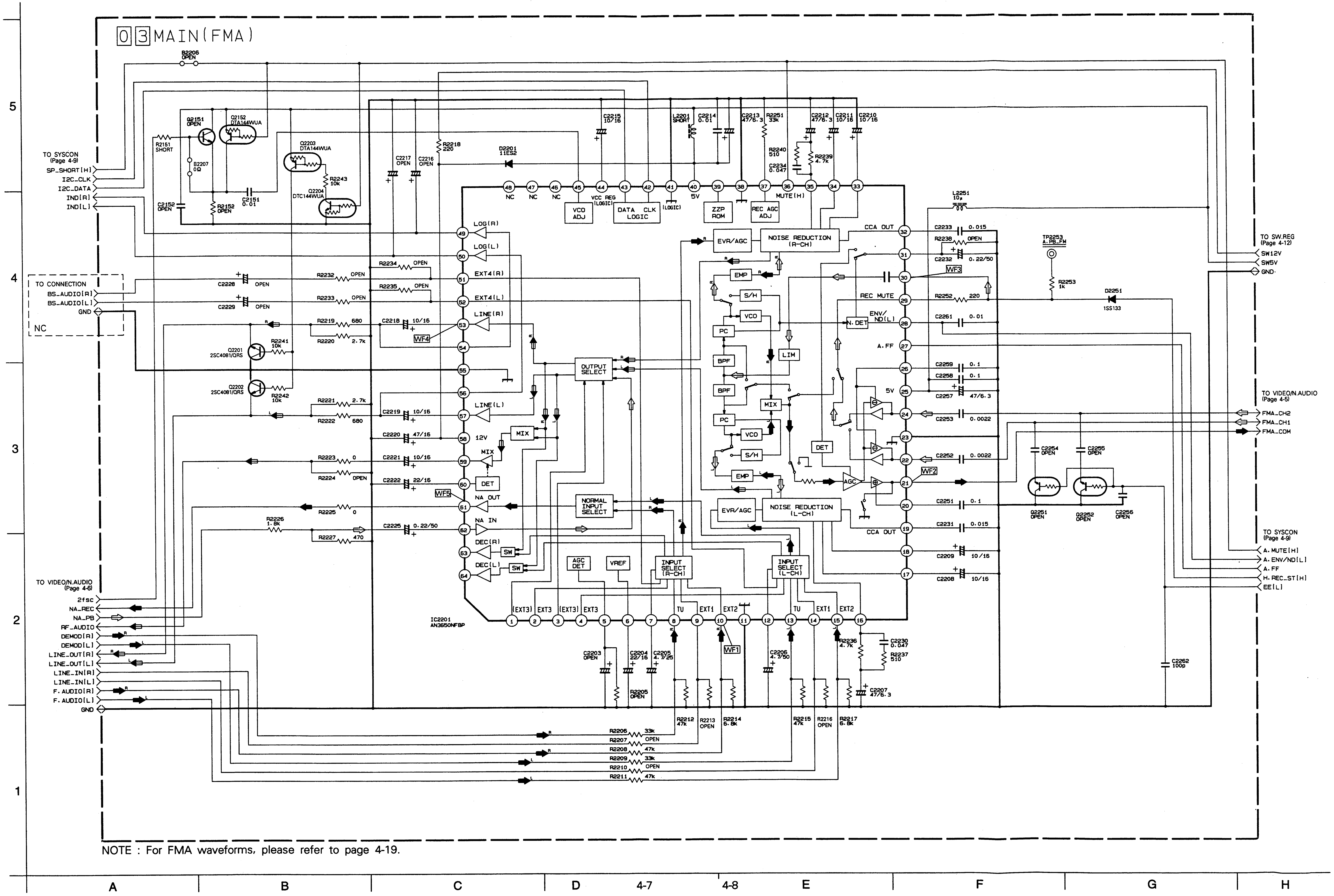
9 3 LT BATTERY
FW7105
CN3007
BACK UP
GND
OPEN
REAR IN
VIDEO AUDIO(R) AUDIO(L)
J1
REAR OUT
VIDEO AUDIO(R) AUDIO(L)
J2
OPEN
ANT OUT ANT IN
TUNER
NC(GND)
AUDIO IN
CH SW
MOD B(5V)
CONV CTL(H)
VIDEO IN
NC(GND)
(RF AGC)
(BT)
TU CE
PLL CLK
PLL DATA
NC(5V)
MB(SW5V)
LOCK(L)
TU(30V)
IF OUT
IF IN
NC
NC
AUDIO OUT
(SIF OUT)
AFT
VIDEO OUT
NC(OPEN)
FRONT VIDEO
FRONT AUDIO
IN
IN(R)
IN(L)
J7101
AC INPUT
AC120V
60Hz
CN5001
LIVE
NEUTRAL
0 6 R. PAUSE
R. PAUSE
A. V. COMP
FW7104
FW3001
R. PAUSE/COMP
GND
9 2 C. BOX CTL
C. BOX
FW7105
FW3002
CABLE_BOX_CTL
LED_RETURN
OPEN
9 4 LED
CN7006
FW7007
LED
LED
CN7005
CN7002
NC
LED
LED
OPEN
6 9 R. L. TRANS.
CN3006
CN3001
NC
NC
AL12V
R. LOC
GND
OPEN
1 4 DEMODU
CN6701
CN1501
N. C
LED
BIL SEL
N. C
DEMOD(R)
DEMOD(L)
SW12V
GND
MPX
OPEN
9 0 LED
OPEN
CN7001
CN3001
MTS
REC
TIMER
TV/VIDEO
GND
POWER
GND
7 6 BS TUNER
CN7101
AL17V
BS P. CTL(L)
AL6V
SW12V
GND(C)
I2C DATA
I2C CLK
BITIN
BS ANT ON(L)
BS ANT
CN6103
CN6102
BS VIDEO
GND
BS AUDIO(L)
GND
BS AUDIO(R)
CN6101
0 9 BS SUB
BIT OUT DET OUT
CN6102
DET OUT
GND
BIT OUT
GND
CN6104
0 3 MAIN
(VIDEO/N. AUDIO. FMA. SYSCON. TUNER. SW. REG. SW/DISPLAY . MV ADV)
3 7 JOG/ SHUTTLE
CN7004
CN7011
JSA
JSB
GND
STL(L)/C2
SHTL(L)/C2
J2
J1
CN2001
REC
PB
GND
AUDIO ERASE
GND
CTL(-)
CTL(+)
CN1
1 2 A/C HEAD
R/P A. E CTL
CN2002
GND
FULL ERASE
FULL ERASE HEAD
F. E
CN3002
M12V
GND
DRUM_CTL_V
D. PG
D. FG
CN1
DRUM MOTOR
M
CH1
EP CH1
EP CH1
EP CH2
EP CH2
SP CH1
SP CH1
SP CH2
SP CH2
FMA CH1
COMMON
FMA CH2
U. DRUM
EP CH1
EP CH2
SP CH1
SP CH2
FMA CH1
FMA CH2
CN3001
GND(C)
CAP_FG
CAP_CTL_V
SW5V
GND(M)
CAP_REV(L)
NC
M12V
CAP MDA
M
CN3004
LSB
LSC
LSA
GND
ROTARY ENCODER
CN3003
LDM1
LDM2
M
5 5 LOADING MOTOR
CN7003
T1
T2
T3
T4
C1
T6
CN7004
8 5 SHUTTLE /PLAY
OPEN
5 5 LOADING MOTOR
1 2 A/C HEAD
0 3 MAIN
NO NAME
1
2
3
4
5
A
B
C
D
E
F
G
H

4.2 VIDEO/N.AUDIO SCHEMATIC DIAGRAM


03 MAIN[VIDEO/N.AUDIO]
TO SW.REG (Page 4-12)
SW5V
SW12V
GND
TO SYSCON (Page 4-10)
C.SYNC
P.MUTE[L]
V.PULSE
GND
D.FF
VIDEO_ENV
fsc
N.REC[H]
A.MUTE[H]
N.REC_ST[H]
TO CONNECTION
NC
BS_VIDEO
GND
TO TUNER (Page 4-14)
RF_VIDEO
RF_AUDIO
DEMOD[L]
DEMOD[R]
TU_VIDEO
GND
GND
J7101
FRONT VIDEO IN
FRONT AUDIO IN (L)
FRONT AUDIO IN (R)
REAR IN
J1
AUDIO(R)
AUDIO(L)
VIDEO
OPEN
REAR OUT
J2
AUDIO(R)
AUDIO(L)
VIDEO
TO FMA (Page 4-8)
FMA_CH1
FMA_COM
FMA_CH2
TO U.DRUM
CN1
FMA CH2
FMA CH1
SP CH2
SP CH1
EP CH2
EP CH1
TO SYSCON (Page 4-10)
SP_SHORT[H]
CTL[+]
CTL[-]
GND
TO A/C HEAD
CN2001
P/R
A.E
CTL
TO FE HEAD
CN2002
FE
IC1
JCP8017-NVA
WF1
WF2
WF3
WF4
WF5
WF6
WF7
WF8
WF9
WF10
WF11
WF12
WF13
WF14
TO SYSCON (Page 4-10)
PAL_EP_CTL/BS[H]
I2C_CLK2
I2C_DATA2
KILLER/BS_P.CTL[L]/EP_SHORT[
VIDEO_OSD_OUT
VIDEO_OUT
PAL_ON_M[L]/BS_ANT
SMART_P
TU_V_MUTE[H]
TO MV ADV (Page 4-17)
VIDEO_OUT
GND
HSW
MA_AUDIO
TO FMA (Page 4-7)
GND
2fsc
NA_PB
NA_REC
DEMOD[L]
DEMOD[R]
F.AUDIO[L]
F.AUDIO[R]
LINE_IN[L]
LINE_IN[R]
RF_AUDIO
LINE_OUT[L]
LINE_OUT[R]
5
4
3
2
1
A
B
C
D
E
F
G
H

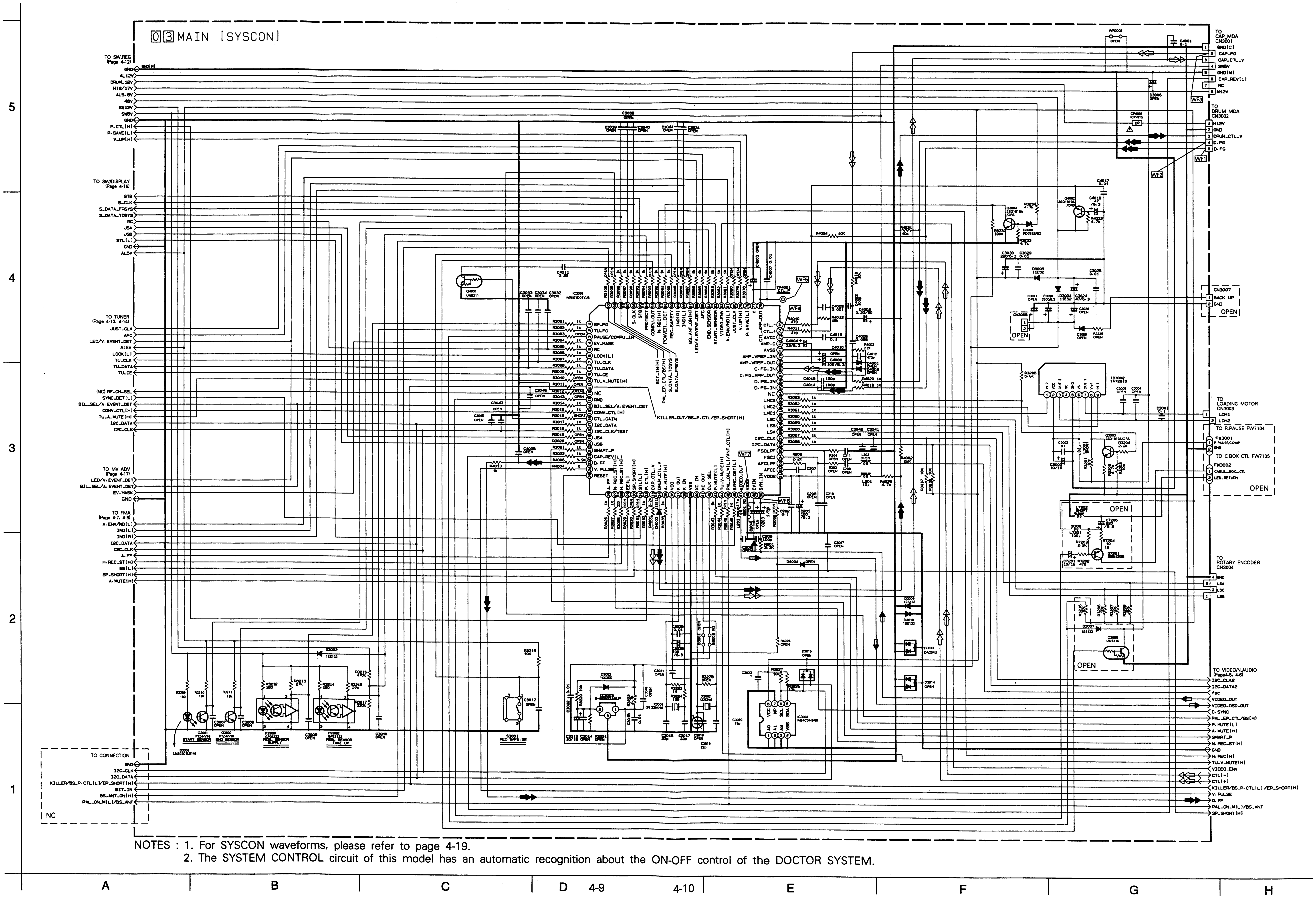
NOTE : For VIDEO/N.AUDIO waveforms, please refer to page 4-19.

4.3 FMA SCHEMATIC DIAGRAM


03 MAIN (FMA)
TO SYSCON (Page 4-9)
SP_SHORT[H]
I2C_CLK
I2C_DATA
IND[R]
IND[L]
TO CONNECTION
BS_AUDIO[R]
BS_AUDIO[L]
GND
NC
TO VIDEO/N.AUDIO (Page 4-6)
2fsc
NA_REC
NA_PB
RF_AUDIO
DEMOD[R]
DEMOD[L]
LINE_OUT[R]
LINE_OUT[L]
LINE_IN[R]
LINE_IN[L]
F.AUDIO[R]
F.AUDIO[L]
GND
B2206 OPEN
Q2151 OPEN
Q2152 DTA144WUA
R2151 SHORT
B2207 0Ω
R2152 OPEN
C2152 OPEN
C2151 0.01
Q2203 DTA144WUA
Q2204 DTC144WUA
R2243 10k
C2217 OPEN
C2216 OPEN
R2218 220
D2201 11ES2
C2215 10/16
L2201 SHORT
C2214 0.01
C2213 47/6.3
R2251 33k
R2240 510
C2234 0.047
C2212 47/6.3
C2211 10/16
C2210 10/16
R2239 4.7k
VCO ADJ
VCC REG (LOGIC)
DATA CLK LOGIC
(LOGIC)
5V
ZZP ROM
REC AGC ADJ
MUTE(H)
NC
LOG(R)
LOG(L)
EXT4(R)
EXT4(L)
LINE(R)
LINE(L)
12V
MIX
DET
NA OUT
NA IN
DEC(R)
DEC(L)
SW
OUTPUT SELECT
NORMAL INPUT SELECT
AGC DET
VREF
INPUT SELECT (R-CH)
INPUT SELECT (L-CH)
EVR/AGC
NOISE REDUCTION (R-CH)
NOISE REDUCTION (L-CH)
EMP
S/H
VCO
PC
BPF
LIM
MIX
DET
AGC
N.DET
CCA OUT
REC MUTE
ENV/ND(L)
A.FF
5V
R2234 OPEN
R2235 OPEN
R2232 OPEN
R2233 OPEN
C2228 OPEN
C2229 OPEN
R2219 680
R2220 2.7k
C2218 10/16
WF4
Q2201 2SC4081/QRS
Q2202 2SC4081/QRS
R2241 10k
R2242 10k
R2221 2.7k
R2222 680
C2219 10/16
C2220 47/16
R2223 0
R2224 OPEN
C2221 10/16
C2222 22/16
WF5
R2225 0
R2226 1.8k
R2227 470
C2225 0.22/50
IC2201 AN3650NFBP
[EXT3] EXT3 [EXT3] EXT3
TU EXT1 EXT2
C2203 OPEN
C2204 22/16
C2205 4.7/25
R2205 OPEN
WF1
C2206 4.7/50
R2236 4.7k
C2230 0.047
R2237 510
C2207 47/6.3
R2212 47k
R2213 OPEN
R2214 6.8k
R2215 47k
R2216 OPEN
R2217 6.8k
R2206 33k
R2207 OPEN
R2208 47k
R2209 33k
R2210 OPEN
R2211 47k
L2251 10μ
C2233 0.015
R2238 OPEN
C2232 0.22/50
WF3
R2252 220
C2261 0.01
C2259 0.1
C2258 0.1
C2257 47/6.3
C2253 0.0022
C2252 0.0022
WF2
C2251 0.1
C2231 0.015
C2209 10/16
C2208 10/16
TP2253 A.PB_FM
R2253 1k
D2251 1SS133
C2254 OPEN
C2255 OPEN
Q2251 OPEN
Q2252 OPEN
C2256 OPEN
C2262 100p
TO SW.REG (Page 4-12)
SW12V
SW5V
GND
TO VIDEO/N.AUDIO (Page 4-5)
FMA_CH2
FMA_CH1
FMA_COM
TO SYSCON (Page 4-9)
A.MUTE[H]
A.ENV/ND[L]
A.FF
H.REC_ST[H]
EE[L]
1
2
3
4
5
A
B
C
D
E
F
G
H

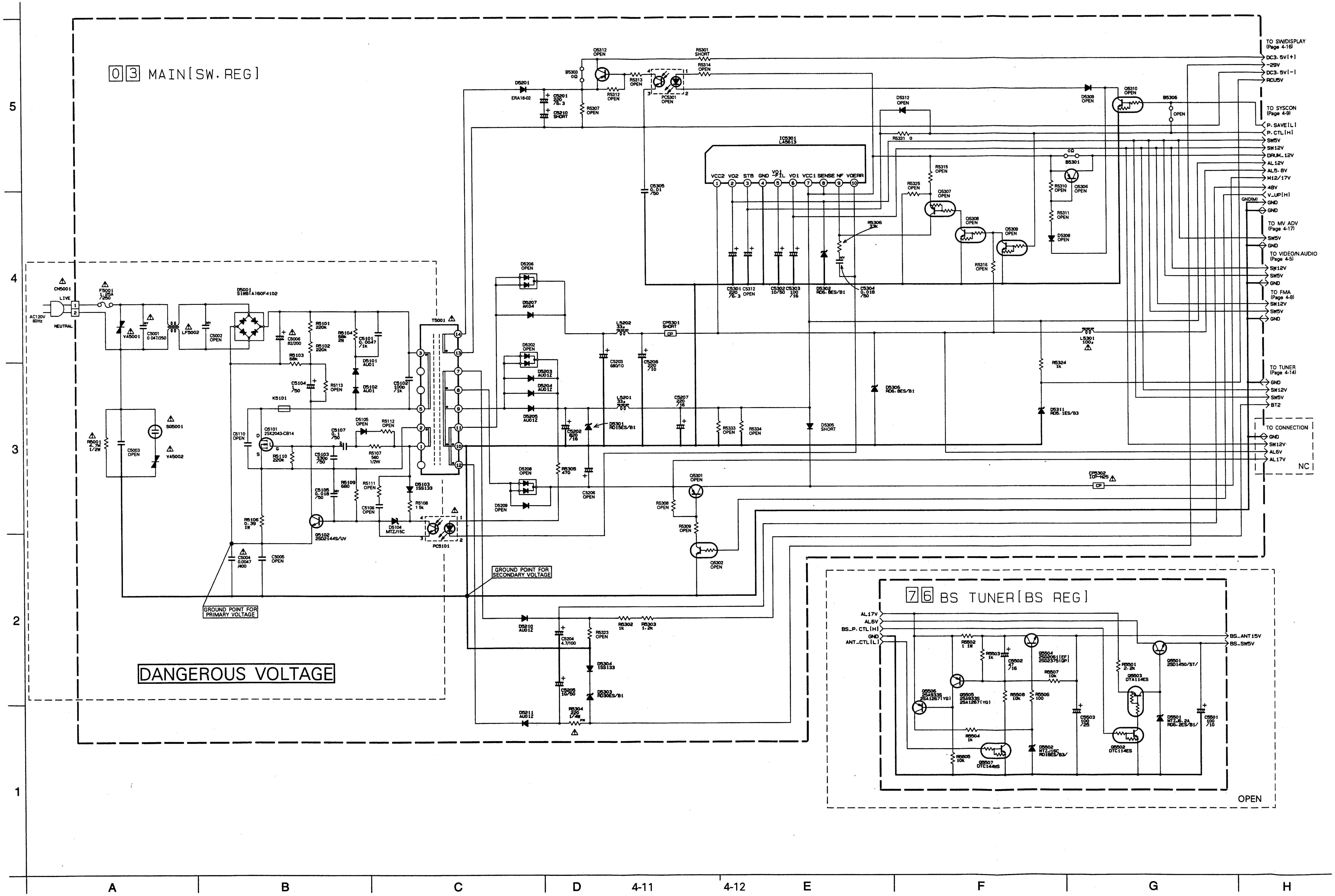
NOTE : For FMA waveforms, please refer to page 4-19.

4.4 SYSTEM CONTROL SCHEMATIC DIAGRAM


03 MAIN [SYSCON]
TO SW.REG (Page 4-12)
GND
AL12V
DRUM_12V
M12/17V
AL5.6V
46V
SW12V
SW5V
GND
P.CTL[H]
P.SAVE[L]
V_UP[H]
TO SW/DISPLAY (Page 4-16)
STB
S_CLK
S_DATA_FRSYS
S_DATA_TOSYS
RC
JSA
JSB
STL[L]
GND
AL5V
TO TUNER (Page 4-13, 4-14)
JUST_CLK
AFC
LED/V.EVENT_DET
AL5V
LOCK[L]
TU_CLK
TU_DATA
TU_CE
(NC) RF_CH_SEL
SYNC_DET[L]
BIL_SEL/A.EVENT_DET
CONV_CTL[H]
TU_A_MUTE[H]
I2C_DATA
I2C_CLK
TO MV ADV (Page 4-17)
LED/V.EVENT_DET
BIL_SEL/A.EVENT_DET
EV_MASK
GND
TO FMA (Page 4-7, 4-8)
A.ENV/NO[L]
IND[L]
IND[R]
I2C_DATA
I2C_CLK
A.FF
H.REC_ST[H]
EE[L]
SP_SHORT[H]
A.MUTE[H]
TO CONNECTION
GND
I2C_CLK
I2C_DATA
KILLER/BS_P.CTL[L]/EP_SHORT[H]
BIT_IN
BS_ANT_ON[H]
PAL_ON_M[L]/BS_ANT
NC
IC3001 MN101D01YJB
Q4001 UN5211
SP_FG
TU_FG
PAUSE/COMPU_IN
EV_MASK
RC
LOCK[L]
TU_CLK
TU_DATA
TU_CE
TU_A_MUTE[H]
NC
RMD
BIL_SEL/A.EVENT_DET
CONV_CTL[H]
CTL_GAIN
I2C_DATA
I2C_CLK/TEST
JSA
JSB
SMART_P
CAP_REV[L]
D.FF
V.PULSE
RESET
KILLER_OUT/BS_P.CTL/EP_SHORT[H]
BIT_IN[H]
PAL_EP_CTL/BS[H]
S_DATA_TOSYS
S_DATA_FRSYS
CTL_AMP_OUT
CTL-
CTL+
AVCC
AMP_C
AVSS
AMP_VREF_IN
AMP_VREF_OUT
C.FG_IN
C.FG_AMP_OUT
D.FG_IN
D.FG_IN
NC
LMC3
LMC2
LMC1
LSC
LSB
LSA
I2C_CLK
I2C_DATA
FSCLRF
FSCI
AFCLRF
AFCC
VDD2
WF1
WF2
WF3
WF4
WF5
WF6
WF7
TO CAP_MDA CN3001
GND[C]
CAP_FG
CAP_CTL_V
SW5V
GND[M]
CAP_REV[L]
NC
M12V
CP4001 ICP-N15
TO DRUM MDA CN3002
M12V
GND
DRUM_CTL_V
D.PG
D.FG
CN3007
BACK UP
GND
OPEN
CN3008
IC3002 TA7291S
TO LOADING MOTOR CN3003
LDM1
LDM2
TO R.PAUSE FW7104
FW3001
R.PAUSE/COMP
GND
TO C.BOX CTL FW7105
FW3002
CABLE_BOX_CTL
LED_RETURN
OPEN
Q3003 2SD1819A/QRS
L7202 SHORT
L7201 100µ
Q7201 2SB1256
TO ROTARY ENCODER CN3004
GND
LSA
LSC
LSB
D3007 1SS133
Q3006 UN5211
OPEN
TO VIDEO/N.AUDIO (Page4-5, 4-6)
I2C_CLK2
I2C_DATA2
FSC
VIDEO_OUT
VIDEO_OSD_OUT
C.SYNC
PAL_EP_CTL/BS[H]
P.MUTE[L]
A.MUTE[H]
SMART_P
N.REC_ST[H]
GND
N.REC[H]
TU_V_MUTE[H]
VIDEO_ENV
CTL[-]
CTL[+]
KILLER/BS_P.CTL[L]/EP_SHORT[H]
V.PULSE
D.FF
PAL_ON_M[L]/BS_ANT
SP_SHORT[H]
Q3001 PT24V16 START SENSOR
Q3002 PT24V16 END SENSOR
D3001 LN82301L01W
PS3001 GP2S122 REEL SENSOR SUPPLY
PS3002 GP2S122 REEL SENSOR TAKE UP
D3002 1SS133
S3001 REC.SAFE.SW
IC3003 S-80828ANMP
X3001 (14.32MHz)
X3002 32kHz
IC3004 M24C04-BN6
D3013 DA204U
D3014 OPEN
D3015 OPEN
D4004 OPEN
1
2
3
4
5
A
B
C
D
E
F
G
H

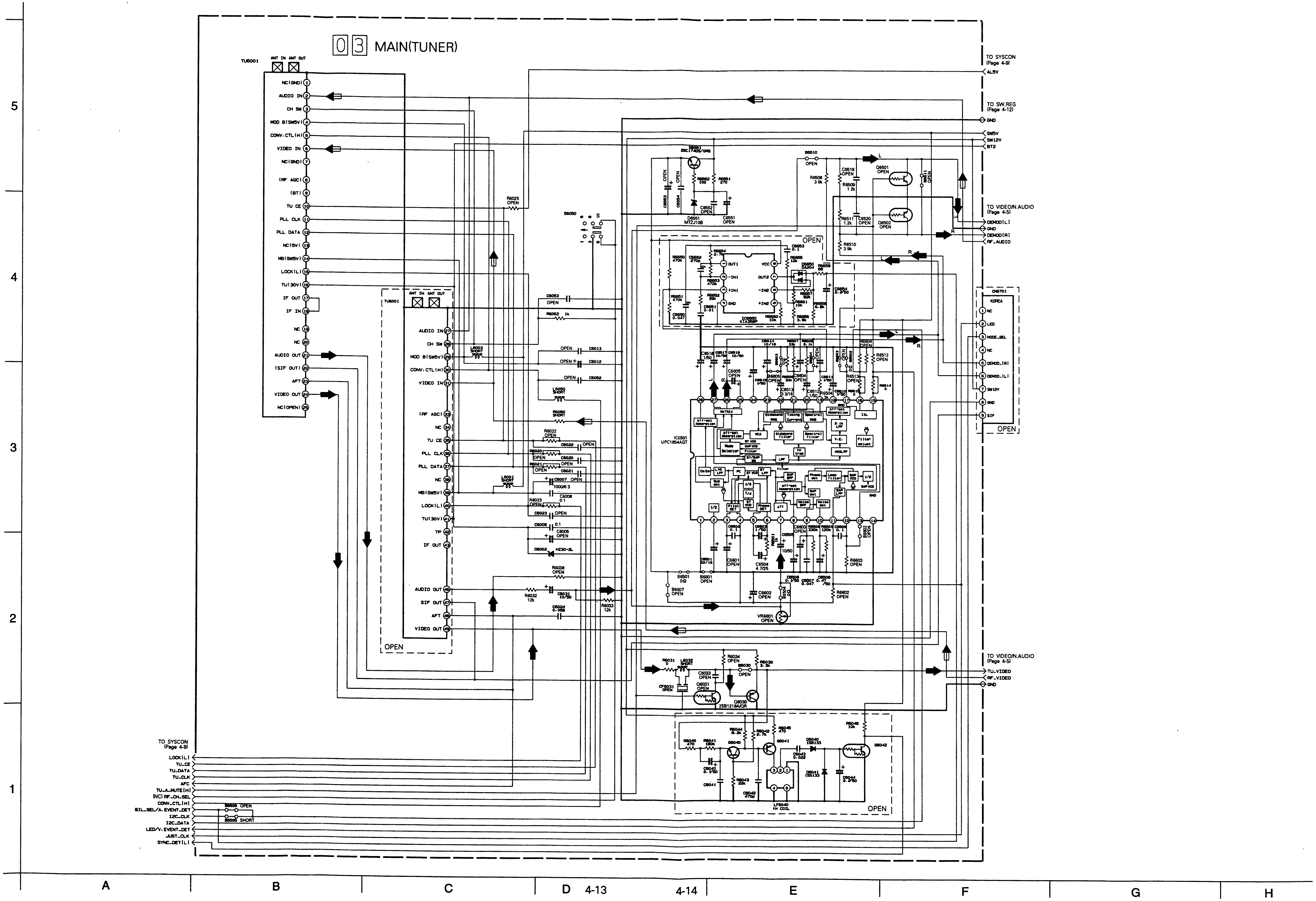
NOTES : 1. For SYSCON waveforms, please refer to page 4-19.
2. The SYSTEM CONTROL circuit of this model has an automatic recognition about the ON-OFF control of the DOCTOR SYSTEM.

4.5 SWITCHING REGULATOR SCHEMATIC DIAGRAM

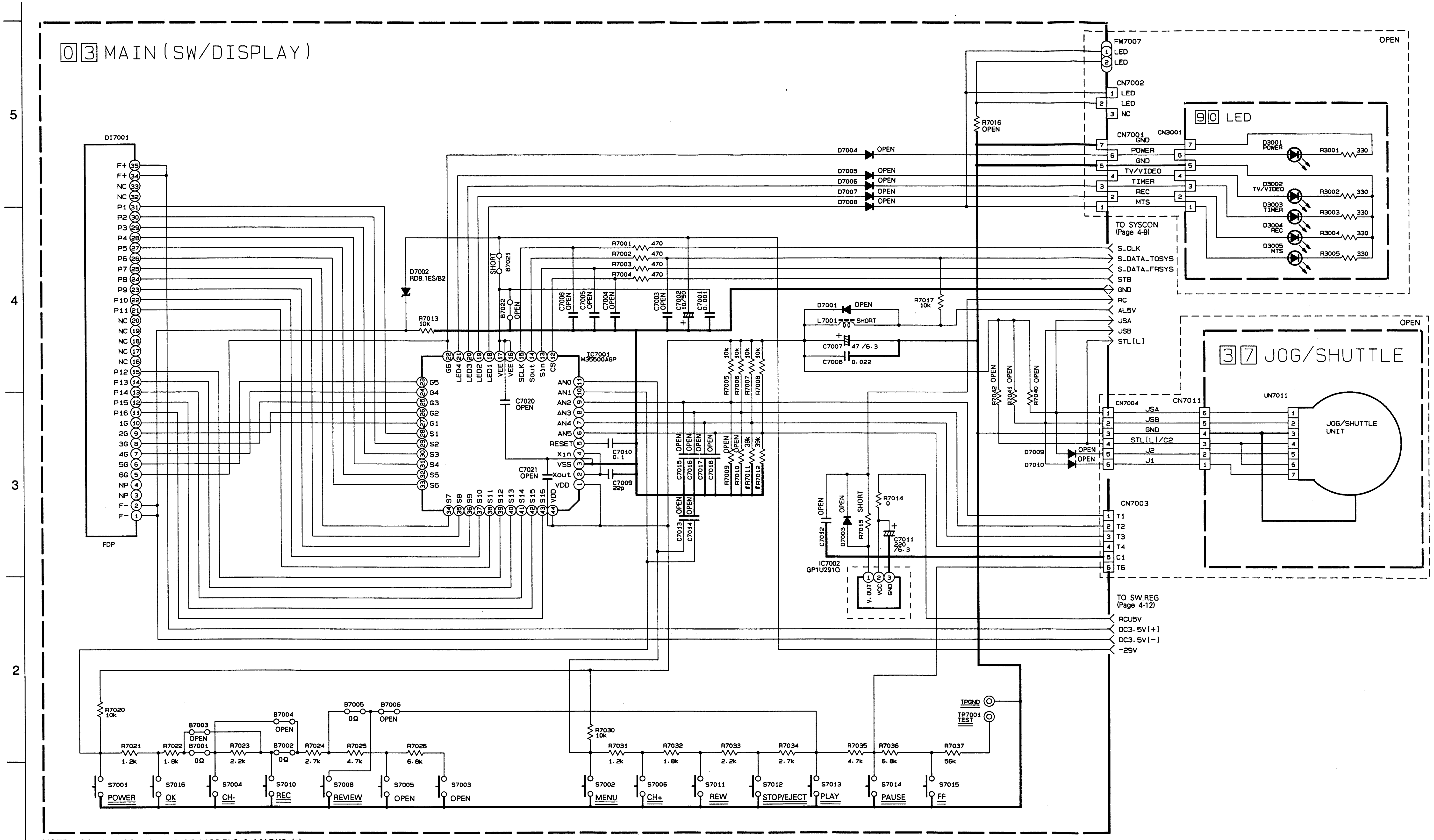


03 MAIN[SW. REG]
DANGEROUS VOLTAGE
CN5001
LIVE
NEUTRAL
AC120V 60Hz
F5001 1.25A /250
VA5001
C5001 0.047/250
LF5002
C5002 OPEN
D5001 S1WB(A)60F4102
C5006 82/200
R5101 220k
R5102 220k
R5103 68k
R5104 68k 2W
C5101 0.0047 /1k
D5101 AU01
D5102 AU01
C5104 1 /50
R5113 OPEN
C5102 100p /1k
K5101
R5001 4.7M 1/2W
C5003 OPEN
SG5001
VA5002
C5110 OPEN
Q5101 2SK2043-CB14
D
G
S
R5110 220k
C5107 0.1 /50
D5105 OPEN
R5112 OPEN
R5107 560 1/2W
C5103 330p /50
C5105 0.018 /50
R5109 680
R5111 OPEN
C5106 OPEN
D5103 1SS133
R5108 1.5k
D5104 MTZJ15C
PC5101
R5106 0.39 1W
Q5102 2SD2144S/UV
C5004 0.0047 /400
C5005 OPEN
GROUND POINT FOR PRIMARY VOLTAGE
T5001
GROUND POINT FOR SECONDARY VOLTAGE
D5201 ERA18-02
C5201 220 /6.3
C5210 SHORT
B5303 0Ω
Q5312 OPEN
R5307 OPEN
R5312 OPEN
R5313 OPEN
PC5301 OPEN
R5301 SHORT
R5314 OPEN
C5305 0.01 /50
IC5301 LA5613
VCC2 VO2 STB GND VO1-FIL VO1 VCC1 SENSE NF VOERR
C5301 220 /6.3
C5312 OPEN
C5302 10/50
C5303 100 /16
D5302 RD6.8ES/B1
R5306 33k
C5304 0.018 /50
D5312 OPEN
R5331 0
D5309 OPEN
Q5310 OPEN
B5306 OPEN
0Ω B5301
R5315 OPEN
R5325 OPEN
Q5307 OPEN
Q5308 OPEN
Q5309 OPEN
R5316 OPEN
R5310 OPEN
Q5306 OPEN
R5311 OPEN
D5308 OPEN
D5206 OPEN
D5207 AK04
D5202 OPEN
D5203 AU01Z
D5204 AU01Z
D5205 AU01Z
L5202 33μ
CP5301 SHORT
C5203 680/10
C5208 220 /10
L5201 33μ
C5207 220 /16
C5202 820 /16
D5301 RD15ES/B1
R5333 OPEN
R5334 OPEN
D5305 SHORT
D5306 RD6.8ES/B1
L5301 100μ
R5324 1k
D5311 RD5.1ES/B3
D5208 OPEN
D5209 OPEN
R5305 470
C5206 OPEN
Q5301 OPEN
R5308 OPEN
R5309 OPEN
Q5302 OPEN
CP5302 ICP-N25
D5210 AU01Z
C5204 4.7/100
R5323 OPEN
R5302 1k
R5303 1.2k
D5304 1SS133
C5205 10/50
D5303 RD30ES/B1
D5211 AU01Z
R5304 220 1/4W
TO SW/DISPLAY (Page 4-16)
DC3.5V(+)
-29V
DC3.5V(-)
RCU5V
TO SYSCON (Page 4-9)
P.SAVE(L)
P.CTL(H)
SW5V
SW12V
DRUM_12V
AL12V
AL5.8V
M12/17V
48V
V_UP(H)
GND(M)
GND
GND
TO MV ADV (Page 4-17)
SW5V
GND
TO VIDEO/N.AUDIO (Page 4-5)
SW12V
SW5V
GND
TO FMA (Page 4-8)
SW12V
SW5V
GND
TO TUNER (Page 4-14)
GND
SW12V
SW5V
BT2
TO CONNECTION
GND
SW12V
AL6V
AL17V
NC
76 BS TUNER[BS REG]
AL17V
AL6V
BS_P.CTL(H)
GND
ANT_CTL(L)
BS_ANT15V
BS_SW5V
R5502 1 1W
R5503 1k
C5502 47 /16
Q5504 2SD2061(EF) 2SD2375(QP)
R5507 10k
Q5506 2SA933S 2SA1267(YG)
Q5505 2SA933S 2SA1267(YG)
R5508 10k
R5506 100
C5503 100 /25
R5504 1k
R5505 10k
Q5507 DTC144WS
D5502 MTZJ16C RD16ES/B3/
R5501 2.2k
Q5503 DTA114ES
Q5502 DTC114ES
Q5501 2SD1450/ST/
D5501 MTZJ6.2A RD6.2ES/B1/
C5501 100 /10
OPEN
5
4
3
2
1
A
B
C
D
4-11
4-12
E
F
G
H

4.6 TUNER SCHEMATIC DIAGRAM


03 MAIN(TUNER)
TU6001
ANT IN ANT OUT
NC(GND)
AUDIO IN
CH SW
MOD B(SW5V)
CONV. CTL(H)
VIDEO IN
NC(GND)
(RF AGC)
(BT)
TU CE
PLL CLK
PLL DATA
NC(5V)
MB(SW5V)
LOCK(L)
TU(30V)
IF OUT
IF IN
NC
AUDIO OUT
(SIF OUT)
AFT
VIDEO OUT
NC(OPEN)
TO SYSCON (Page 4-9)
AL5V
TO SW.REG (Page 4-12)
GND
SW5V
SW12V
BT2
TO VIDEO/N.AUDIO (Page 4-5)
DEMOD(L)
GND
DEMOD(R)
RF_AUDIO
CN5701
KOREA
NC
LED
MODE_SEL
DEMOD_(R)
DEMOD_(L)
SW12V
GND
SIF
OPEN
IC6650 KIA358P
IC6501 UPC1854AGT
TO VIDEO/N.AUDIO (Page 4-5)
TU_VIDEO
RF_VIDEO
GND
Q6030 2SB1218A/QR
Q6031 OPEN
LF6040 FM COIL
TO SYSCON (Page 4-9)
LOCK(L)
TU_CE
TU_DATA
TU_CLK
AFC
TU_A_MUTE(H)
(NC) RF_CH_SEL
CONV_CTL(H)
BIL_SEL/A. EVENT_DET
I2C_CLK
I2C_DATA
LED/V. EVENT_DET
JUST_CLK
SYNC_DET(L)
5
4
3
2
1
A
B
C
D
E
F
G
H

4.7 SW/DISPLAY SCHEMATIC DIAGRAM

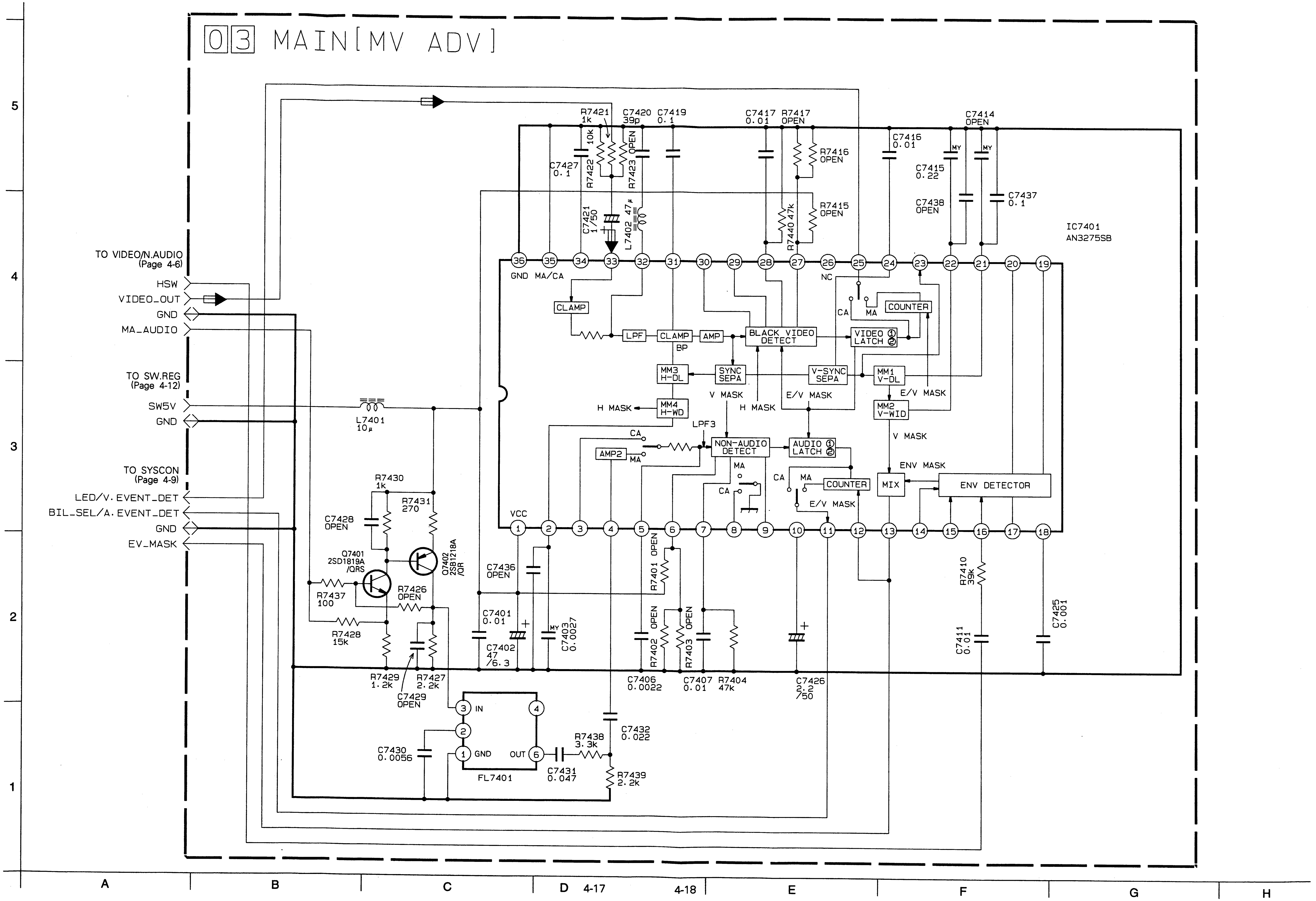


03 MAIN (SW/DISPLAY)
DI7001
FDP
F+ F+ NC NC P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11 NC NC NC NC NC P12 P13 P14 P15 P16 1G 2G 3G 4G 5G 6G NP NP F- F-
IC7001
M35500AGP
G6 LED4 LED3 LED2 LED1 VEE VEE SCLK Sout Sin CS
G5 G4 G3 G2 G1 S1 S2 S3 S4 S5 S6
S7 S8 S9 S10 S11 S12 S13 S14 S15 S16 VDD
AN0 AN1 AN2 AN3 AN4 AN5 RESET Xin VSS Xout VDD
D7002
RD9.1ES/B2
R7013
10k
SHORT
B7021
B7022
OPEN
C7020
OPEN
C7021
OPEN
C7010
0.1
C7009
22p
R7001 470
R7002 470
R7003 470
R7004 470
C7006 OPEN
C7005 OPEN
C7004 OPEN
C7003 OPEN
C7002 10/50
C7001 0.001
D7004 OPEN
D7005 OPEN
D7006 OPEN
D7007 OPEN
D7008 OPEN
D7001 OPEN
L7001 SHORT
C7007 47/6.3
C7008 0.022
R7017 10k
R7016 OPEN
R7005 10k
R7006 10k
R7007 10k
R7008 10k
C7015 OPEN
C7016 OPEN
C7017 OPEN
C7018 OPEN
R7009 OPEN
R7010 OPEN
#R7011 39k
#R7012 39k
C7013 OPEN
C7014 OPEN
C7012 OPEN
D7003 SHORT
R7015 SHORT
R7014 0
C7011 220/6.3
IC7002
GP1U291Q
V.OUT VCC GND
FW7007
LED
LED
CN7002
LED
LED
NC
CN7001
CN3001
GND
POWER
GND
TV/VIDEO
TIMER
REC
MTS
OPEN
90 LED
D3001 POWER
D3002 TV/VIDEO
D3003 TIMER
D3004 REC
D3005 MTS
R3001 330
R3002 330
R3003 330
R3004 330
R3005 330
TO SYSCON (Page 4-9)
S_CLK
S_DATA_TOSYS
S_DATA_FRSYS
STB
GND
RC
AL5V
JSA
JSB
STL[L]
37 JOG/SHUTTLE
UN7011
JOG/SHUTTLE UNIT
R7042 OPEN
R7041 OPEN
R7040 OPEN
D7009 OPEN
D7010 OPEN
CN7004
CN7011
JSA
JSB
GND
STL[L]/C2
J2
J1
CN7003
T1 T2 T3 T4 C1 T6
TO SW.REG (Page 4-12)
RCU5V
DC3.5V[+]
DC3.5V[-]
-29V
TPGND
TP7001 TEST
R7020 10k
R7021 1.2k
R7022 1.8k
B7003 OPEN
B7001 0Ω
R7023 2.2k
B7004 OPEN
B7002 0Ω
R7024 2.7k
B7005 0Ω
B7006 OPEN
R7025 4.7k
R7026 6.8k
S7001 POWER
S7016 OK
S7004 CH-
S7010 REC
S7008 REVIEW
S7005 OPEN
S7003 OPEN
R7030 10k
R7031 1.2k
R7032 1.8k
R7033 2.2k
R7034 2.7k
R7035 4.7k
R7036 6.8k
R7037 56k
S7002 MENU
S7006 CH+
S7011 REW
S7012 STOP/EJECT
S7013 PLAY
S7014 PAUSE
S7015 FF
5
4
3
2
1
A B C D E F G H

NOTE : COMPARISON CHART OF MODELS & MARKS (#).

	REF.NO.	R7011	R7012
MODEL	HR-VP670U HR-VP670U(C)	USED	NOT USED
	HR-VP672U HR-VP673U HR-VP673U(C)	NOT USED	USED

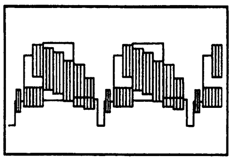
4.8 MOVIE ADVANCE SCHEMATIC DIAGRAM


03 MAIN[MV ADV]
TO VIDEO/N.AUDIO (Page 4-6)
HSW
VIDEO_OUT
GND
MA_AUDIO
TO SW.REG (Page 4-12)
SW5V
GND
TO SYSCON (Page 4-9)
LED/V. EVENT_DET
BIL_SEL/A. EVENT_DET
GND
EV_MASK
IC7401
AN3275SB
GND
MA/CA
NC
VCC
CLAMP
LPF
CLAMP
BP
AMP
BLACK VIDEO DETECT
VIDEO ① LATCH ②
COUNTER
CA
MA
SYNC SEPA
V-SYNC SEPA
MM1 V-DL
MM2 V-WID
MM3 H-DL
MM4 H-WD
H MASK
V MASK
E/V MASK
LPF3
AMP2
NON-AUDIO DETECT
AUDIO ① LATCH ②
COUNTER
E/V MASK
MIX
ENV MASK
ENV DETECTOR
R7421 1k
R7422 10k
R7423 OPEN
C7420 39p
C7419 0.1
C7427 0.1
C7421 1/50
L7402 47μ
C7417 0.01
R7417 OPEN
R7416 OPEN
R7415 OPEN
R7440 47k
C7416 0.01
C7414 OPEN
C7415 0.22
C7438 OPEN
C7437 0.1
MY
L7401 10μ
R7430 1k
R7431 270
C7428 OPEN
Q7401 2SD1819A /QRS
Q7402 2SB1218A /QR
R7437 100
R7426 OPEN
R7428 15k
R7429 1.2k
R7427 2.2k
C7429 OPEN
C7436 OPEN
C7401 0.01
C7402 47 /6.3
C7403 0.0027
R7401 OPEN
R7402 OPEN
R7403 OPEN
C7406 0.0022
C7407 0.01
R7404 47k
C7426 2.2 /50
R7410 39k
C7411 0.01
C7425 0.001
FL7401
IN
GND
OUT
C7430 0.0056
C7431 0.047
R7438 3.3k
C7432 0.022
R7439 2.2k
A
B
C
D
E
F
G
H
1
2
3
4
5

WAVEFORMS

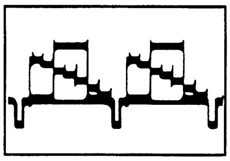
— VIDEO/N.AUDIO —

WF1 IC1-30



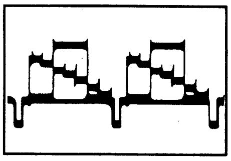
REC 1.0 Vp-p
50 mV/20 µsec/DIV

WF2-1 IC1-23



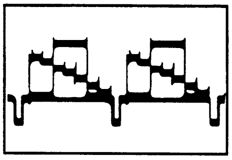
REC 0.52 Vp-p
20 mV/20 µsec/DIV

WF2-2 IC1-23



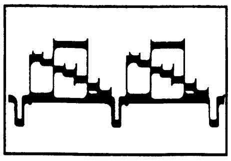
PB 0.57 Vp-p
20 mV/20 µsec/DIV

WF3-1 IC1-19



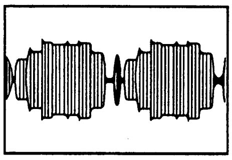
REC 0.54 Vp-p
20 mV/20 µsec/DIV

WF3-2 IC1-19



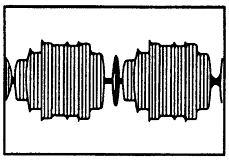
PB 0.57 Vp-p
20 mV/20 µsec/DIV

WF4-1 IC1-58



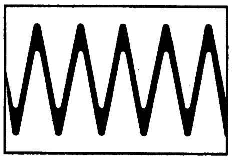
REC 0.6 Vp-p
20 mV/20 µsec/DIV

WF4-2 IC1-58



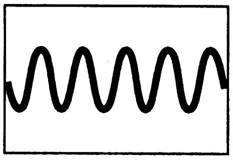
PB 0.56 Vp-p
20 mV/20 µsec/DIV

WF5 IC1-4



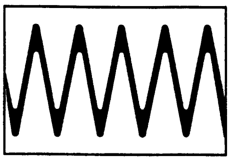
REC 0.8 Vp-p
20 mV/0.5 msec/DIV

WF6 IC1-9



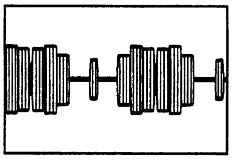
REC 0.12 Vp-p
5 mV/0.5 msec/DIV

WF7 IC1-11



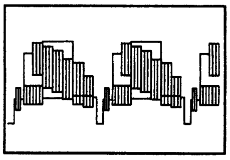
PB 0.8 Vp-p
20 mV/0.5 msec/DIV

WF8 IC1-55



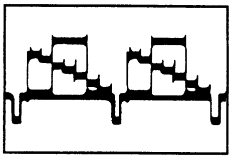
PB 0.62 Vp-p
20 mV/20 µsec/DIV

WF9 IC1-52



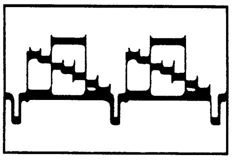
REC/PB 2.2 Vp-p
0.1 V/20 µsec/DIV

WF10-1 IC1-42



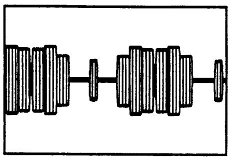
REC 0.4 Vp-p
10 mV/20 µsec/DIV

WF10-2 IC1-42



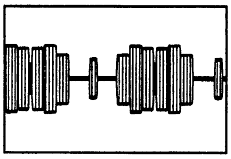
PB 0.45 Vp-p
10 mV/20 µsec/DIV

WF11-1 IC1-46



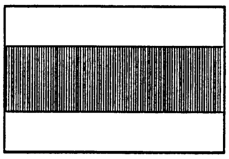
REC 0.38 Vp-p
10 mV/20 µsec/DIV

WF11-2 IC1-46



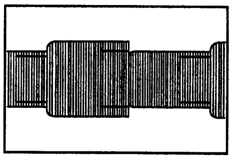
PB 0.32 Vp-p
10 mV/20 µsec/DIV

WF12 IC1-87



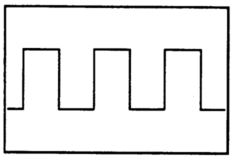
REC 1.9 Vp-p
0.1 V/1 msec/DIV

WF13 TP106 PB FM



PB 0.5 Vp-p
20 mV/1 msec/DIV

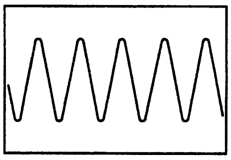
WF14 TP111 D.FF



REC/PB 5.1 Vp-p
0.2 V/10 msec/DIV

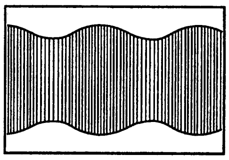
— FMA —

WF1 IC2201-10



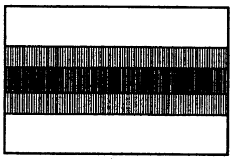
REC 0.1 Vp-p
2 mV/0.5 msec/DIV

WF2 IC2201-21



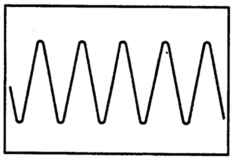
REC 0.34 Vp-p
10 mV/0.5 msec/DIV

WF3 IC2201-30



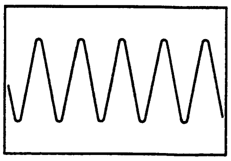
PB 2.4 Vp-p
50 mV/0.1 msec/DIV

WF4-1 IC2201-53



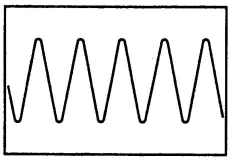
REC 1.1 Vp-p
20 mV/0.5 msec/DIV

WF4-2 IC2201-53



PB 0.84 Vp-p
20 mV/0.5 msec/DIV

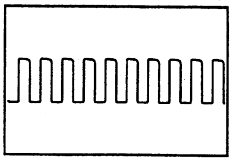
WF5 IC2201-61



REC 0.11 Vp-p
2 mV/0.5 msec/DIV

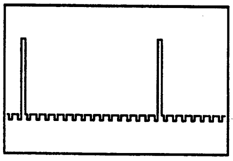
— SYSCON —

WF1 CN3002-5 D.FG



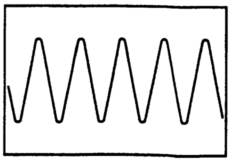
REC/PB 4.5 Vp-p
0.2 V/5 msec/DIV

WF2 CN3002-4 D.PG



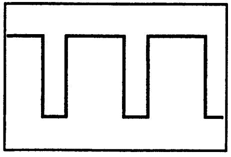
REC/PB 4.6 Vp-p
0.1 V/5 msec/DIV

WF3 CN3001-2 CAP FG



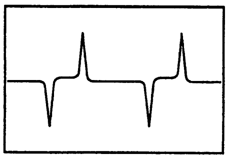
REC/PB 2.1 Vp-p
50 mV/0.5 msec/DIV

WF4 IC3001-74 CTL(+)



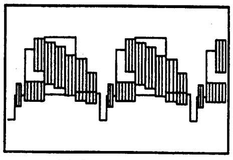
REC 3.6 Vp-p
0.1 V/10 msec/DIV

WF5 TP4001 CTL.P



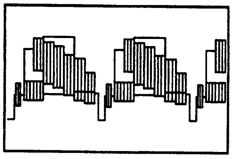
PB 3.2 Vp-p
0.1 V/5 msec/DIV

WF6 IC3001-49 CVIN



REC/PB 2.2 Vp-p
0.1 V/20 µsec/DIV

WF7 IC3001-47 VIDEO OUT



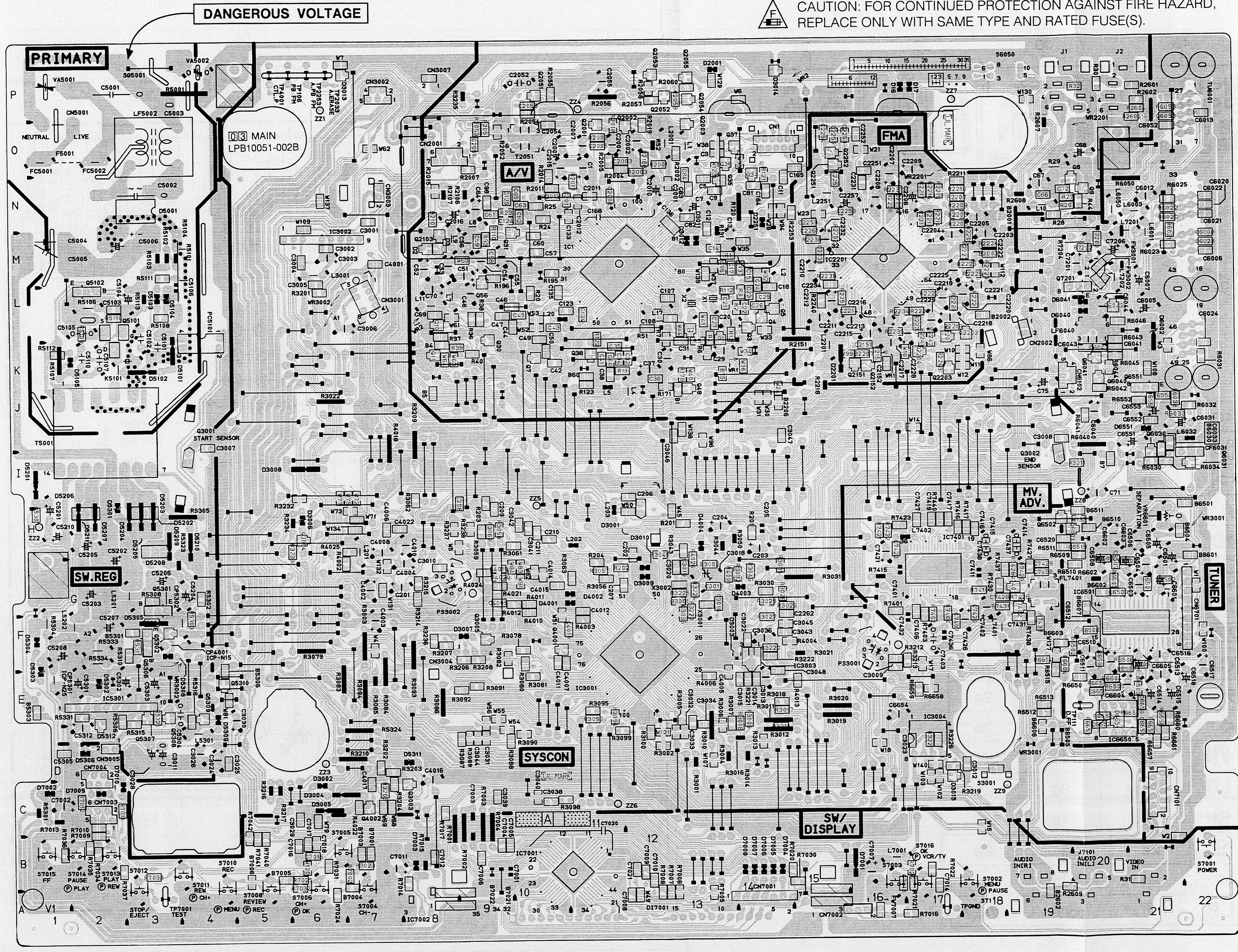
REC/PB 2.2 Vp-p
0.1 V/20 µsec/DIV

COMPONENT PARTS LOCATION GUIDE <MAIN>

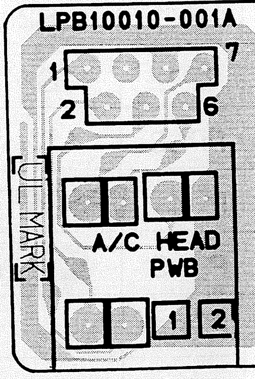
REF.NO.	LOCATION		
CAPACITOR			
C1	A	D	11O
C3	B	C	13O
C5	B	C	13N
C7	A	D	13N
C9	B	C	13N
C11	B	C	14N
C12	B	C	13M
C13	A	D	13M
C14	B	C	13M
C15	B	C	14M
C17	B	C	14M
C18	B	C	14L
C20	A	D	14L
C21	B	C	13L
C22	B	C	14L
C23	B	C	14L
C24	B	C	14L
C25	B	C	14L
C26	B	C	14L
C27	B	C	13L
C29	A	D	13K
C30	A	D	12K
C31	B	C	13K
C32	B	C	12K
C34	B	C	11K
C35	B	C	11K
C36	B	C	12K
C37	A	D	12K
C38	B	C	11K
C40	B	C	11K
C41	B	C	11K
C42	B	C	10K
C43	B	C	10L
C44	B	C	10L
C45	B	C	10L
C46	B	C	10L
C47	B	C	9L
C48	A	D	9L
C49	B	C	10K
C50	B	C	10K
C51	A	D	9M
C52	A	D	8M
C53	A	D	8M
C54	A	D	9M
C55	A	D	9M
C56	A	D	9M
C57	B	C	10M
C58	B	C	9M
C59	B	C	9M
C60	B	C	10M
C61	B	C	9N
C62	B	C	10N
C63	B	C	10N
C64	A	D	9N
C65	B	C	10N
C66	B	C	19N
C67	A	D	19N
C68	A	D	20O
C69	B	C	8L
C70	A	D	8L
C71	A	D	20I
C72	B	C	19N
C75	A	D	19K
C81	B	C	14N
C82	B	C	13N
C83	B	C	13N
C84	B	C	13N
C95	B	C	13M
C98	B	C	9N
C107	B	C	12L
C108	B	C	12L
C123	B	C	11L
C124	B	C	9N
C125	B	C	10N
C133	B	C	11N
C134	B	C	11L
C135	B	C	10L
C136	B	C	12N
C137	B	C	14M
C164	B	C	14N
C165	B	C	15O
C168	A	D	11N
C201	A	D	7G
C202	B	C	12H
C203	A	D	14H
C204	A	D	13H
C205	A	D	14H
C206	B	C	12I
C207	B	C	12G
C208	B	C	9H
C209	B	C	9H
C210	B	C	10H
C211	B	C	10H
C2001	B	C	12N
C2002	A	D	12O
C2003	B	C	12O
C2004	A	D	11O
C2005	B	C	11O
C2007	A	D	11O
C2008	B	C	11N
C2009	A	D	11O
C2010	A	D	12N
C2011	B	C	11N
C2012	B	C	11N
C2013	B	C	11N
C2015	A	D	10O
C2016	A	D	9N
C2051	B	C	9O
C2052	A	D	10P
C2053	B	C	10P
C2054	B	C	10O
C2055	A	D	11P
C2151	B	C	16K
C2152	B	C	16K
C2203	A	D	18M
C2204	A	D	17M
C2205	A	D	18N
C2206	A	D	17N
C2207	A	D	16N
C2208	A	D	16N
C2209	A	D	17O
C2210	A	D	15M
C2211	A	D	15L
C2212	A	D	15L
C2213	A	D	16L
C2214	B	C	16L
C2215	A	D	16L
C2216	A	D	16L
C2217	A	D	16K
C2218	A	D	17L
C2219	A	D	17L
C2220	A	D	18L
C2221	A	D	18L
C2222	A	D	18M
C2225	A	D	17M
C2228	A	D	17K
C2229	A	D	17L
C2230	B	C	17N
C2231	B	C	16N
C2232	A	D	15M
C2233	B	C	15M
C2234	B	C	15L
C2251	B	C	16N
C2252	B	C	16O
C2253	B	C	16O
C2254	B	C	15O
C2255	B	C	15O
C2256	B	C	15N
C2257	A	D	15N
C2258	B	C	16N
C2259	B	C	15N
C2261	B	C	15M
C2262	B	C	14F
C3001	B	C	7N
C3002	B	C	6M
C3003	A	D	6M
C3004	B	C	6M
C3005	B	C	6M
C3006	A	D	7L
C3007	B	C	4J
C3008	B	C	19J
C3009	B	C	16E
C3010	B	C	8G
C3011	A	D	3D
C3012	B	C	18D
C3013	A	D	14E
C3014	B	C	14E
C3015	B	C	14E
C3016	B	C	13G
C3017	B	C	13G
C3018	A	D	13G
C3019	B	C	13G
C3020	B	C	12G
C3022	B	C	14F
C3023	B	C	17D
C3024	A	D	4D
C3025	B	C	4D
C3026	A	D	4D
C3028	A	D	3D
C3029	B	C	6C
C3030	A	D	5D
C3031	B	C	9D
C3032	B	C	13D
C3033	B	C	13D
C3034	B	C	13D
C3035	B	C	13F
C3036	A	D	14F
C3038	B	C	10C
C3039	B	C	9C
C3040	B	C	10C
C3041	B	C	10H
C3042	B	C	10H
C3043	B	C	14F
C3044	B	C	9D
C3045	B	C	14F
C3046	B	C	12J
C3047	B	C	14J
C3048	B	C	14E
C4001	B	C	7M
C4002	A	D	7G
C4003	A	D	7F
C4004	A	D	8G
C4005	B	C	13E
C4006	B	C	7H
C4007	B	C	10F
C4008	A	D	7H
C4009	B	C	9G
C4010	A	D	8H
C4011	B	C	10F
C4012	B	C	11G
C4014	B	C	10G
C4015	B	C	10G
C4016	A	D	8C
C4017	B	C	7C
C4019	B	C	11F
C4022	B	C	8H
C5001	A	D	2P
C5002	A	D	2N
C5003	A	D	4P
C5004	A	D	1M
C5005	A	D	1M
C5006	A	D	2M
C5101	A	D	3K
C5102	A	D	3K
C5103	B	C	2L
C5104	A	D	3L
C5105	A	D	2L
C5106	A	D	4L
C5107	A	D	2K
C5110	A	D	2K
C5201	A	D	1I
C5202	A	D	3H
C5203	A	D	2G
C5204	A	D	4G
C5205	A	D	2H
C5206	A	D	3G
C5207	A	D	2F
C5208	A	D	1F
C5210	A	D	1H
C5301	A	D	2E
C5302	A	D	3E
C5303	A	D	3E
C5304	A	D	4E
C5305	B	C	1D
C5312	A	D	2D
C6005	A	D	21L
C6006	B	C	22M
C6007	A	D	21M
C6008	B	C	22M
C6012	A	D	21N
C6013	B	C	22O
C6020	B	C	22N
C6021	B	C	22N
C6022	B	C	22N
C6023	B	C	22M
C6024	B	C	22K
C6031	A	D	22J
C6033	B	C	21I
C6040	A	D	20J
C6041	B	C	20K
C6042	B	C	20K
C6043	B	C	20K
C6044	A	D	20L
C6052	B	C	21O
C6053	B	C	21O
C6501	A	D	21G
C6502	B	C	21G
C6503	A	D	21G
C6504	A	D	21G
C6505	A	D	21G
C6506	A	D	21H
C6507	B	C	20G
C6508	A	D	20G
C6509	B	C	20G
C6510	A	D	20F
C6511	A	D	20E
C6512	A	D	20F
C6513	A	D	21F
C6514	A	D	21E
C6515	A	D	21E
C6516	A	D	21F
C6517	A	D	22F
C6518	A	D	22E
C6519	B	C	20H
C6520	B	C	19H
C6551	A	D	21J
C6552	B	C	21J
C6553	A	D	21J
C6554	B	C	21J
C6601	A	D	21G
C6602	A	D	20H
C6603	A	D	21G
C6604	A	D	21E
C6605	A	D	21E
C6650	B	C	21E
C6651	B	C	20E
C6652	B	C	20D
C6653	B	C	21D
C6654	A	D	16E
C7001	A	D	9B
C7002	A	D	1C
C7003	A	D	9C
C7004	B	C	9B
C7005	B	C	9B
C7006	B	C	9B
C7007	A	D	16B
C7008	B	C	12A
C7009	B	C	12B
C7010	B	C	12B
C7011	A	D	7B
C7012	B	C	8B
C7013	B	C	16A
C7014	B	C	17A
C7015	B	C	6B
C7016	B	C	6B
C7017	B	C	6B
C7018	B	C	6B
C7020	A	D	10B
C7021	B	C	12B
C7201	A	D	20M
C7206	A	D	21M
C7401	A	D	16G
C7402	A	D	18F
C7403	A	D	17F
C7406	B	C	17F
C7407	B	C	17F
C7411	A	D	18G
C7414	A	D	19G
C7415	A	D	18G
C7416	B	C	18H
C7417	B	C	17H
C7419	B	C	17H
C7420	B	C	16H
C7421	A	D	16G
C7425	B	C	18F
C7426	A	D	18F
C7427	B	C	17H
C7428	B	C	18G
C7429	B	C	19G
C7430	B	C	19G
C7431	B	C	19F
C7432	A	D	17F
C7436	A	D	17F
C7437	B	C	19H
C7438	B	C	18H
CONNECTOR			
CN1	A	D	14O
CN2001	A	D	9O
CN2002	A	D	19L
CN3001	A	D	7L
CN3002	A	D	7P
CN3003	A	D	7N
CN3004	A	D	9F
CN3005	A	D	2D
CN3007	A	D	8P
CN5001	A	D	1O
CN6102	A	D	19K
CN6701	A	D	22G
CN7001	A	D	13A
CN7002	A	D	16A
CN7003	A	D	2C
CN7004	A	D	2C
CN7101	A	D	21C
CIRCUIT PROTECTOR			
CP4001	A	D	4F
CP5301	A	D	1F
CP5302	A	D	4G
DIODE			
D2	B	C	8M
D3	B	C	8M
D16	A	D	17P
D17	A	D	17P
D2001	A	D	13P
D2201	A	D	15K
D2251	A	D	14M
D3001	A	D	12H
D3002	A	D	6C
D3003	B	C	14F
D3004	A	D	7C
D3005	A	D	7C
D3006	A	D	6H
D3007	A	D	8F
D3008	A	D	6i
D3009	A	D	12G
D3010	A	D	12G
D3011	A	D	13M
D3012	A	D	13M
D3013	B	C	7P
D3014	B	C	14P
D3015	B	C	17C
D4001	A	D	10G
D4002	A	D	11G
D4003	A	D	14G
D4004	A	D	13H
D5001	B	C	3N
D5101	A	D	3K
D5102	A	D	3K
D5103	A	D	3L
D5104	A	D	3L
D5105	A	D	2K
D5201	A	D	1I
D5202	A	D	3H
D5203	A	D	3I
D5204	A	D	3I
D5205	A	D	3I
D5206	A	D	2H
D5207	A	D	2I
D5208	A	D	3H
D5209	A	D	3H
D5210	A	D	4H
D5211	A	D	2H
D5301	A	D	2I
D5302	A	D	2E
D5303	A	D	1F
D5304	A	D	1F
D5305	A	D	3F
D5306	A	D	2D
D5308	A	D	3F
D5309	A	D	4D
D5311	A	D	7D
D5312	B	C	2E
D6002	A	D	21K
D6040	A	D	20L
D6041	A	D	20L
D6551	A	D	21J
D6650	B	C	20D
D7001	A	D	16B
D7002	A	D	1C
D7003	A	D	8B
D7004	A	D	14B
D7005	A	D	14B
D7006	A	D	14B
D7007	A	D	14B
D7008	A	D	14B
D7009	A	D	2C
D7010	A	D	2C
IC			
IC1	B	C	12M
IC2201	B	C	16M
IC3001	B	C	12F
IC3002	A	D	6M
IC3003	B	C	14F
IC3004	A	D	17D
IC5301	A	D	2E
IC6501	B	C	21F
IC6650	A	D	20E
IC7001	B	C	11B
IC7002	A	D	8A
IC7401	B	C	17G
JACK			
J1	A	D	20P
J2	A	D	21P
J7101	A	D	20A
COIL			
L1	A	D	13O
L2	A	D	14M
L4	A	D	12K
L5	A	D	11K
L7	A	D	9L
L8	A	D	9N
L9	A	D	9M
L10	A	D	19N
L11	A	D	8L
L17	A	D	12L
L20	A	D	10L
L201	A	D	7G
L202	A	D	10H
L203	A	D	11I
L2001	A	D	12O
L2201	A	D	15K
L2251	A	D	15N
L3001	A	D	6M
L5201	A	D	3G
L5202	A	D	2F
L5301	A	D	4D
L6001	A	D	21M
L6003	A	D	21N
L6032	A	D	22J
L6050	A	D	20N
L7001	A	D	17B
L7201	A	D	21M
L7202	A	D	20L
L7401	A	D	18F
L7402	A	D	17H
TRANSISTOR			
Q1	B	C	13K
Q2	B	C	13L
Q3	B	C	14L
Q4	B	C	14L
Q5	B	C	14L
Q7	B	C	10K
Q8	B	C	20N
Q9	B	C	20N
Q10	B	C	8L
Q11	B	C	8K
Q30	B	C	9K
Q31	B	C	10M
Q34	B	C	14N
Q35	B	C	13N
Q36	B	C	13O
Q37	B	C	14O
Q38	B	C	11K
Q49	B	C	13K
Q56	B	C	9M
Q2001	B	C	11O
Q2002	B	C	12O
Q2003	B	C	13O
Q2051	B	C	10P
Q2052	B	C	12P
Q2053	B	C	12P
Q2054	B	C	13P
Q2055	B	C	13P
Q2103	B	C	8M
Q2151	B	C	16K
Q2152	B	C	16K
Q2201	B	C	17K
Q2202	B	C	18L
Q2203	B	C	17K
Q2204	B	C	17K
Q2251	B	C	15O
Q2252	B	C	15O
Q3001	A	D	4I
Q3002	A	D	19I
Q3003	B	C	8C
Q3004	B	C	6H
Q3005	B	C	9F
Q4001	B	C	10F
Q4002	B	C	7C
Q5101	A	D	2L
Q5102	A	D	2L
Q5301	A	D	3G
Q5302	B	C	3F
Q5306	A	D	3F
Q5307	B	C	3E
Q5308	B	C	3E
Q5309	B	C	4E
Q5310	B	C	4E
Q6030	B	C	21I
Q6031	B	C	22I
Q6040	B	C	20K
Q6041	B	C	20K
Q6042	B	C	20L
Q6501	B	C	20H
Q6502	B	C	19H
Q6551	A	D	21J
Q7201	A	D	20L
Q7401	B	C	18G
Q7402	B	C	19G
RESISTOR			
R1	B	C	13M
R2	B	C	14L
R3	B	C	14L
R4	B	C	13K
R5	B	C	13K
R6	B	C	13K
R7	B	C	12K
R11	B	C	12K
R12	B	C	13L
R20	B	C	10L
R23	B	C	9N
R24	B	C	10N
R25	B	C	10N
R26	B	C	20N
R27	B	C	20N
R28	B	C	19N
R29	A	D	19O
R30	B	C	20P
R31	B	C	21B
R32	B	C	20P
R36	B	C	9L
R37	B	C	8L
R38	B	C	9L
R39	B	C	9K
R40	B	C	9K
R44	B	C	20N
R51	B	C	12L
R52	A	D	12O
R53	B	C	9M
R110	B	C	9M
R112	B	C	13L
R120	A	D	14N
R121	B	C	14N
R122	B	C	11K
R123	B	C	11K
R131	A	D	13M
R170	B	C	13K
R171	B	C	12K
R195	B	C	10M
R196	B	C	9M
R201	B	C	14H
R202	B	C	11G
R203	B	C	9H
R204	B	C	11G
R2001	B	C	12O
R2002	B	C	13O
R2003	B	C	12O
R2004	B	C	12O
R2005	B	C	11O
R2006	B	C	11O
R2007	B	C	9O
R2011	B	C	10N
R2012	B	C	11N
R2013	B	C	10N
R2014	B	C	10N
R2015	B	C	8N
R2018	B	C	11O
R2019	B	C	12O
R2051	B	C	9O
R2052	B	C	9O
R2053	B	C	9O
R2054	B	C	10P
R2055	B	C	10P
R2056	A	D	12P
R2057	B	C	12P
R2058	B	C	12P
R2059	B	C	13P
R2060	B	C	13P
R2106	A	D	9N
R2107	A	D	8N
R2108	B	C	12O
R2151	A	D	15K
R2152	B	C	16K
R2205	B	C	18M
R2206	B	C	18N
R2207	B	C	18N
R2208	B	C	18N
R2209	B	C	18N
R2210	B	C	18N
R2211	B	C	18N
R2212	B	C	17N
R2213	B	C	17N
R2214	B	C	17N
R2215	B	C	17N
R2216	B	C	17N
R2217	B	C	17N
R2218	A	D	15J
R2219	B	C	17L
R2220	B	C	17L
R2221	B	C	18L
R2222	B	C	17L
R2223	B	C	18M
R2224	B	C	18M
R2225	B	C	18M
R2226	B	C	18M
R2227	B	C	18M
R2232	B	C	17L
R2233	B	C	17L
R2234	B	C	17L
R2235	B	C	16L
R2236	B	C	16N
R2237	B	C	16N
R2238	B	C	15M
R2239	B	C	15M
R2240	B	C	15L
R2241	B	C	17K
R2242	B	C	17K
R2243	B	C	17K
R2251	B	C	15L
R2252	B	C	15M
R2253	B	C	15N
R2601	B	C	21P
R2602	B	C	21P
R2604	B	C	21P
R2605	B	C	21O
R2607	A	D	19P
R2608	A	D	19N
R2609	B	C	19A
R3001	A	D	13D
R3002	B	C	12D
R3003	A	D	7F
R3004	A	D	13D
R3005	B	C	12D
R3006	B	C	13D
R3007	B	C	13D
R3008	B	C	14D
R3009	B	C	14E
R3010	A	D	13E
R3011	A	D	14D
R3012	A	D	14D
R3013	B	C	14D
R3014	A	D	14D
R3015	B	C	14D
R3016	A	D	13D
R3017	B	C	14E
R3018	B	C	14E
R3019	A	D	16E
R3020	A	D	16E
R3021	A	D	15F
R3022	A	D	7J
R3026	B	C	14G
R3027	B	C	14F
R3028	B	C	14G
R3029	B	C	14G
R3030	B	C	14G
R3031	A	D	15G
R3032	B	C	14G
R3035	B	C	14G
R3043	B	C	13H
R3044	A	D	13H
R3045	B	C	12H
R3046	B	C	14G
R3050	A	D	14H
R3056	B	C	11G
R3057	B	C	11G
R3058	B	C	9H
R3059	B	C	9H
R3060	B	C	9H
R3061	B	C	10H
R3062	B	C	8I
R3063	B	C	11G
R3078	B	C	10F
R3079	A	D	6F
R3080	B	C	10F
R3081	B	C	10E
R3082	B	C	9F
R3083	A	D	6E
R3084	A	D	7E
R3085	A	D	7E
R3086	A	D	8E
R3087	B	C	9D
R3088	B	C	9D
R3089	B	C	9D
R3090	B	C	10D
R3091	B	C	9E
R3092	B	C	9E
R3093	A	D	8F
R3094	A	D	7E
R3095	B	C	11E
R3096	B	C	11E
R3097	B	C	11E
R3098	B	C	10C
R3099	B	C	11D
R3100	B	C	12D
R3201	B	C	6L
R3202	B	C	7D
R3203	B	C	7D
R3204	B	C	7C
R3205	B	C	7C
R3206	B	C	9F
R3207	B	C	8F
R3208	B	C	9F
R3209	A	D	8I
R3210	A	D	7D
R3211	B	C	20I
R3212	B	C	16F
R3213	B	C	17F
R3214	B	C	8G
R3215	B	C	8G
R3216	A	D	5C
R3217	A	D	5C
R3219	B	C	17D
R3220	B	C	14F
R3221	B	C	14E
R3222	B	C	14F
R3223	B	C	13F
R3224	B	C	13G
R3225	B	C	13G
R3226	B	C	17D
R3227	B	C	17D
R3232	B	C	6I
R3233	B	C	6H
R3234	A	D	6H
R3235	A	D	9P
R3236	B	C	8F
R3237	B	C	8H
R3238	B	C	9H
R4001	B	C	13G
R4002	B	C	7G
R4003	B	C	11F
R4004	B	C	14F
R4006	B	C	13E
R4010	B	C	10F
R4011	B	C	10G
R4012	B	C	10G
R4013	B	C	15E
R4018	A	D	7I
R4019	B	C	9G
R4020	B	C	9G
R4021	B	C	9G
R4022	B	C	7C
R4024	B	C	9G
R4025	B	C	7H
R4026	B	C	13G
R5001	A	D	4P
R5101	A	D	4M
R5102	A	D	3M
R5103	A	D	3M
R5104	A	D	4M
R5106	A	D	2L
R5107	A	D	1K
R5108	B	C	3L
R5109	B	C	2L
R5110	B	C	2L
R5111	B	C	3M
R5112	B	C	1K
R5113	A	D	3L
R5301	A	D	1C
R5302	B	C	4G
R5303	B	C	4F
R5304	A	D	1G
R5305	A	D	4H
R5306	B	C	2E
R5307	B	C	1H
R5308	B	C	3G
R5309	B	C	3F
R5310	B	C	3F
R5311	B	C	3F
R5315	B	C	3E
R5316	B	C	4E
R5323	A	D	4H
R5324	A	D	7D
R5325	B	C	3E
R5331	B	C	2E
R5333	A	D	2F
R5334	A	D	2F
R6020	B	C	21N
R6021	B	C	21M
R6022	B	C	21N
R6023	B	C	21M
R6025	B	C	21N
R6030	B	C	21I
R6031	B	C	22K
R6032	B	C	22J
R6033	B	C	21J
R6034	B	C	21I
R6038	B	C	21J
R6040	A	D	20I
R6041	B	C	20J
R6042	B	C	20J
R6043	B	C	20K
R6044	B	C	20K
R6045	B	C	20K
R6046	B	C	20L
R6050	A	D	21N
R6053	B	C	21P
R6501	B	C	21G
R6502	B	C	21G
R6503	B	C	20G
R6504	B	C	20F
R6505	B	C	20E
R6506	B	C	21F
R6507	B	C	21E
R6508	B	C	20F
R6509	B	C	20G
R6510	B	C	20G
R6511	B	C	19H
R6512	B	C	19E
R6513	B	C	19E
R6514	B	C	19F
R6515	B	C	19E
R6551	B	C	21J
R6552	B	C	21J
R6602	A	D	20G
R6603	B	C	20G
R6604	B	C	19E
R6650	B	C	20E
R6651	B	C	20E
R6652	B	C	20D
R6653	B	C	20E
R6654	B	C	21E
R6655	B	C	21D
R6656	B	C	21D
R6657	B	C	21D
R6658	B	C	17E
R6659	B	C	17E
R6660	B	C	21D
R6661	B	C	21D
R7001	A	D	8B
R7002	A	D	9B
R7003	A	D	9B
R7004	A	D	9B
R7005	B	C	13A
R7006	B	C	12A
R7007	B	C	12A
R7008	B	C	12A
R7009	B	C	2C
R7010	B	C	2C
R7011	B	C	2C
R7012	B	C	2C
R7013	A	D	1C
R7014	B	C	8B
R7015	A	D	8B
R7016	B	C	17A
R7017	B	C	8C
R7020	B	C	14B
R7021	B	C	17A
R7022	B	C	17B
R7023	B	C	7B
R7024	B	C	6A
R7025	B	C	6B
R7026	B	C	17B
R7030	B	C	15B
R7031	B	C	6B
R7032	B	C	6B
R7033	B	C	3B
R7034	B	C	2B
R7035	B	C	2B
R7036	B	C	1B
R7037	B	C	2B
R7040	B	C	5B
R7041	B	C	5B
R7042	B	C	5B
R7202	B	C	20M
R7203	B	C	20M
R7204	A	D	20M
R7401	B	C	16F
R7402	B	C	17F
R7403	B	C	17F
R7404	B	C	17F
R7410	B	C	18G
R7415	A	D	16G
R7416	B	C	18H
R7417	B	C	18H
R7421	B	C	16H
R7422	B	C	16H
R7423	B	C	16H
R7426	B	C	19G
R7427	B	C	19G
R7428	B	C	18G
R7429	B	C	19G
R7430	B	C	18G
R7431	B	C	18G
R7437	B	C	18G
R7438	B	C	19F
R7439	B	C	19F
R7440	B	C	17H
SWITCH			
S3001	A	D	18C
S6050	A	D	18P
S7001	A	D	22B
S7002	A	D	18B
S7003	A	D	16B
S7004	A	D	7B
S7005	A	D	6B
S7006	A	D	6B
S7008	A	D	5B
S7010	A	D	4B
S7011	A	D	4B
S7012	A	D	3B
S7013	A	D	2B
S7014	A	D	2B
S7015	A	D	1B
S7016	A	D	17B
TEST POINT			
TP106	A	D	6P
TP111	A	D	20E
TP2033	A	D	6P
TP2253	A	D	6P
TP4001	A	D	5P
TP7001	A	D	3A
TPGND	A	D	17A
OTHER			
CF6031	A	D	22I
DI7001	A	D	12A
F5001	A	D	1O
FL7401	A	D	19G
FW3001	A	D	20M
FW3002	A	D	20L
FW7007	A	D	16A
K5101	A	D	2K
LF5002	A	D	4O
LF6040	A	D	20K
PC5101	A	D	4L
PS3001	A	D	16F
PS3002	A	D	8G
SG5001	A	D	3P
T2051	A	D	10O
T5001	A	D	1K
TU6001	A	D	22P
VA5001	A	D	1P
VA5002	A	D	4P
VR6601	A	D	21H
WR1	A	D	13K
WR2	A	D	15P
WR2201	A	D	17N
WR3001	A	D	22H
WR3002	A	D	6L
X1	A	D	13L
X2	A	D	13L
X3001	A	D	13G
X3002	A	D	13G

4.9 MAIN AND A/C HEAD CIRCUIT BOARDS

CAUTION: FOR CONTINUED PROTECTION AGAINST FIRE HAZARD,
REPLACE ONLY WITH SAME TYPE AND RATED FUSE(S).

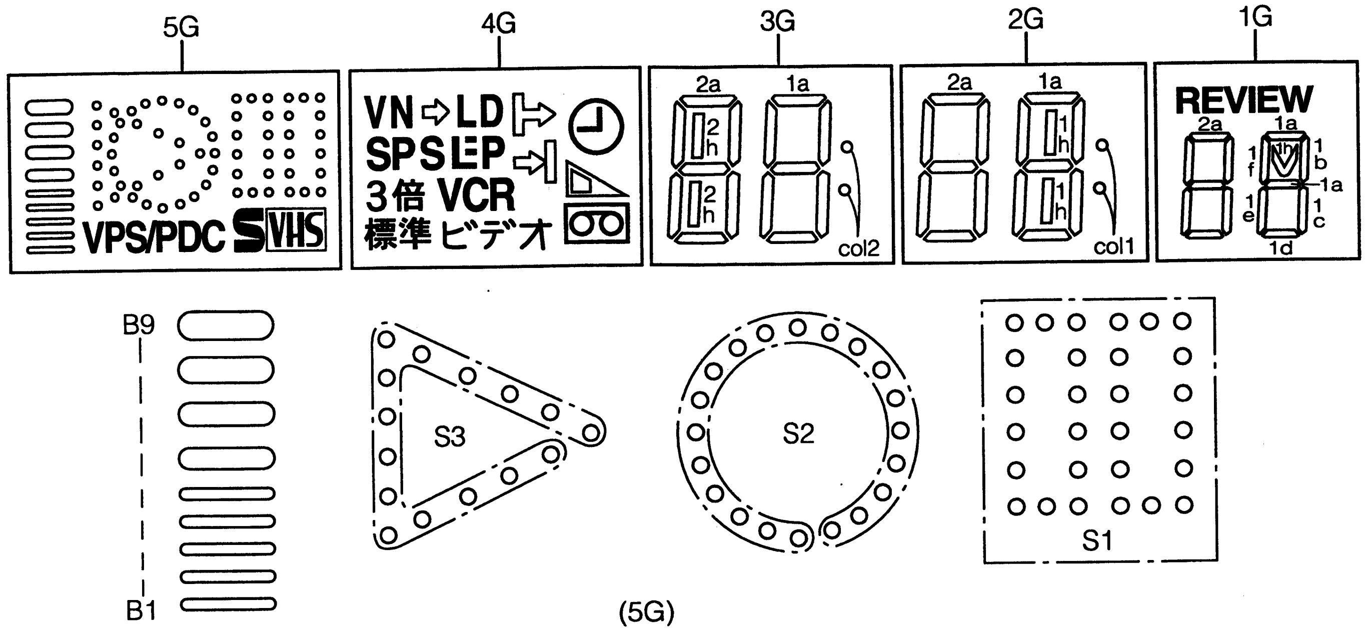

DANGEROUS VOLTAGE
PRIMARY
MAIN
LPB10051-002B
A/V
FMA
SW.REG
MV. ADV.
TUNER
SYSCON
SW/DISPLAY
NEUTRAL
LIVE
Q3001 START SENSOR
Q3002 END SENSOR
S7015 FF
S7016 PAUSE PLAY
S7012 REW
S7010 REC
S7011 REW CH+
S7008 REVIEW REC
S7006 OK
S7004 CH-
S7016 OK VCR/TV
S7002 MENU PAUSE
S7001 POWER
TP7001 TEST
STOP/EJECT
AUDIO IN(R)
AUDIO IN(L)
VIDEO IN

— A/C HEAD —


LPB10010-001A
1
2
6
7
A/C HEAD PWB
1
2

4.10 FDP GRID ASSIGNMENT AND ANODE CONNECTION

GRID ASSIGNMENT

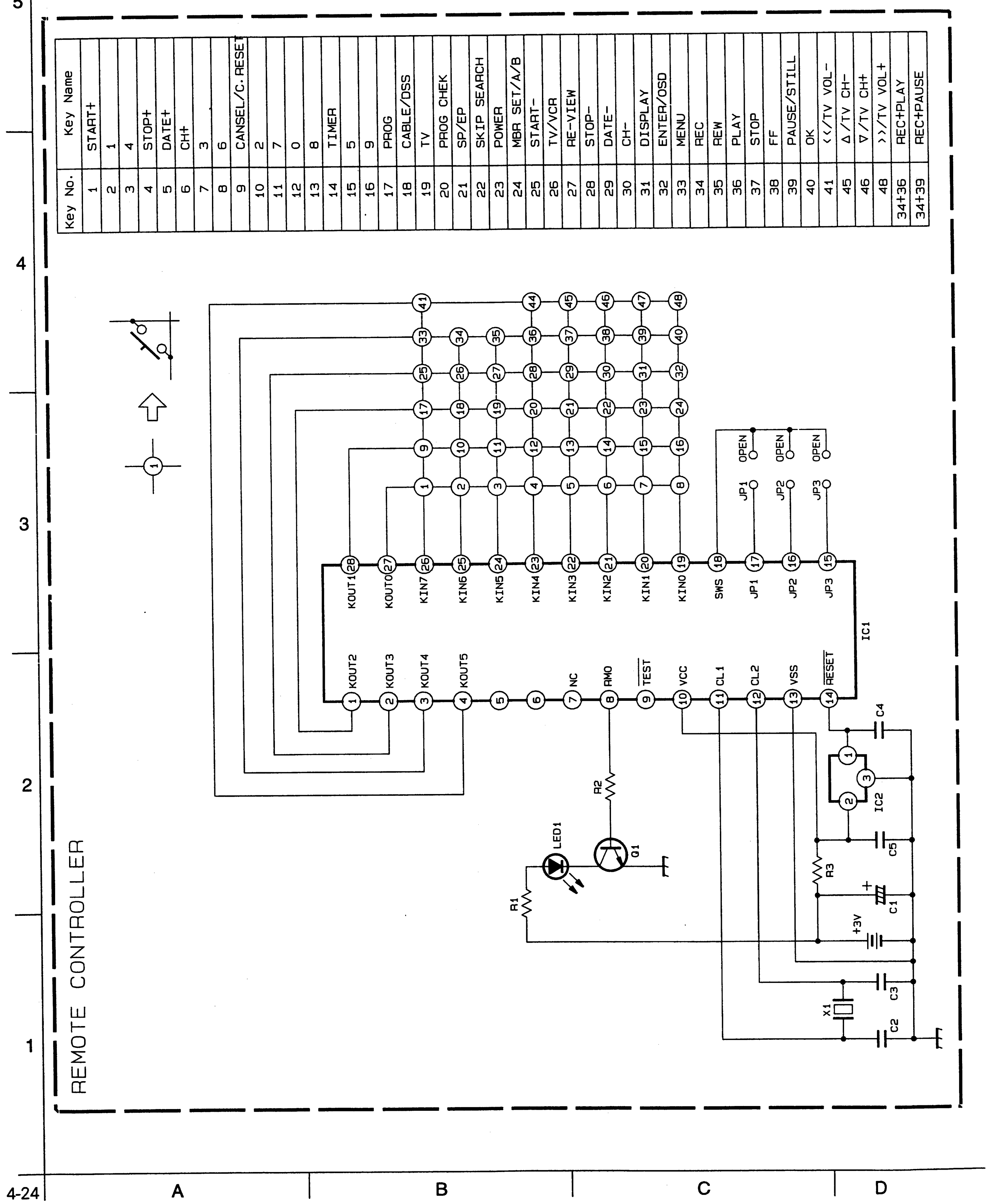

5G
4G
3G
2G
1G
VPS/PDC
SVHS
VN⇨LD
SP SLP
3倍 VCR
標準 ビデオ
2a
1a
2h
1h
col2
col1
REVIEW
1f
1b
1e
1c
1d
B9
B1
S3
S2
S1
(5G)

ANODE CONNECTION

	5G	4G	3G	2G	1G
P 1	S2	⊏⇨	1a	1a	1a
P 2	S1	⇨⎸	1b	1b	1b
P 3	S3	3倍	1f	1f	1f
P 4	VPS/PDC	標準	1g	1g	1g
P 5	SVHS	🕒	1c	1c	1c
P 6	—	◺	1e	1e	1e
P 7	—	⊡	1d	1d	1d
P 8	B9	VCR	col2	1h	1h
P 9	B8	ビデオ	2a	2a	2a
P10	B7	⇨	2b	2b	2b
P11	B6	VN	2f	2f	2f
P12	B5	LD	2g	2g	2g
P13	B4	SP	2c	2c	2c
P14	B3	S (SEP)	2e	2e	2e
P15	B2	= (SEP)	2d	2d	2d
P16	B1	LP(SEP)	2h	col1	REVIEW

4.11 REMOTE CONTROL SCHEMATIC DIAGRAM

NOTES:
1. All parts shown in this schematic are critical for safety.
2. This schematic is only for reference.
Avoid replacing individual parts.
Replace the entire unit only.


5
4
3
2
1
A
B
C
D
REMOTE CONTROLLER
IC1
KOUT1
KOUT0
KIN7
KIN6
KIN5
KIN4
KIN3
KIN2
KIN1
KIN0
SWS
JP1
JP2
JP3
KOUT2
KOUT3
KOUT4
KOUT5
NC
RMO
TEST
VCC
CL1
CL2
VSS
RESET
OPEN
OPEN
OPEN
IC2
C1
C2
C3
C4
C5
R1
R2
R3
LED1
Q1
X1
+3V

Key No.	Key Name
1	START+
2	1
3	4
4	STOP+
5	DATE+
6	CH+
7	3
8	6
9	CANSEL/C.RESET
10	2
11	7
12	0
13	8
14	TIMER
15	5
16	9
17	PROG
18	CABLE/DSS
19	TV
20	PROG CHEK
21	SP/EP
22	SKIP SEARCH
23	POWER
24	MBR SET/A/B
25	START-
26	TV/VCR
27	RE-VIEW
28	STOP-
29	DATE-
30	CH-
31	DISPLAY
32	ENTER/OSD
33	MENU
34	REC
35	REW
36	PLAY
37	STOP
38	FF
39	PAUSE/STILL
40	OK
41	<</TV VOL-
45	Δ/TV CH-
46	∇/TV CH+
48	>>/TV VOL+
34+36	REC+PLAY
34+39	REC+PAUSE

4.12 VOLTAGE CHARTS

<VIDEO/N.AUDIO>

MODE PIN NO.	REC	PLAY
IC1		
1	2.5	2.5
2	2.5	2.5
3	0	0
4	2.5	2.5
5	0	0
6	2.8	2.8
7	2.5	2.5
8	2.5	2.5
9	2.5	2.5
10	2.4	2.4
11	2.4	2.4
12	5.0	5.0
13	1.8	1.5
14	1.9	1.5
15	2.6	3.0
16	1.5	0.8
17	2.3	2.3
18	2.2	2.2
19	3.0	3.0
20	2.7	2.7
21	2.3	2.3
22	2.0	2.0
23	3.0	3.0
24	2.1	2.1
25	1.4	1.4
26	2.0	2.0
27	0	0
28	2.7	2.7
29	1.9	1.9
30	2.7	2.7
31	2.7	2.7
32	0	0
33	0	0
34	0	0
35	3.1	3.1
36	5.0	5.0
37	4.9	4.9
38	5.0	5.0
39	3.1	3.1
40	5.0	5.0
41	5.0	5.0
42	2.0	2.0
43	5.0	5.0
44	2.5	2.5
45	0	0
46	2.0	2.0
47	0	0
48	0	0
49	0	0
50	0.4	0.4
51	0	0
52	2.3	2.3
53	2.8	2.8
54	1.9	1.9
55	2.0	2.0
56	2.7	2.7
57	4.9	4.9
58	3.1	3.1
59	2.8	3.0
60	2.1	2.1
61	5.0	5.0
62	3.9	3.9
63	4.0	4.0
64	0	0
65	0	0
66	5.0	5.0
67	5.0	5.0
68	0	0
69	2.7	2.7
70	2.6	2.6
71	-	-
72	2.3	2.3
73	-	-
74	2.6	1.0
75	0	0
76	2.4	2.4
77	0	0
78	2.7	2.7
79	4.0	2.0
80	0	0
81	2.5	2.5
82	1.2	1.2
83	2.4	2.4
84	0	3.5
85	0	0
86	2.4	2.2
87	2.4	2.2
88	2.4	2.2
89	2.4	2.2
90	5.0	5.0
91	0	0
92	0	0
93	0	0
94	0	0
95	0.5	0.5
96	5.0	5.0
97	0	0
98	5.0	5.0
99	0.5	2.5
100	2.5	2.5
Q8		
E	3.0	3.0
C	0	0
B	5.0	5.0
Q9		
E	3.0	3.0
C	0	0
B	2.3	2.3
Q49		
E	4.9	4.9
C	5.0	5.0
B	2.8	2.8
Q56		
E	0	0
C	1.9	1.9
B	0	0
Q2001		
E	-11.2	0
C	0	0
B	-18.1	0.7
Q2002		
E	-11.2	0
C	0	0
B	-17.9	0.7
Q2003		
E	5.0	5.0
C	-18.0	5.0
B	4.9	0
Q2051		
E	0	0
C	7.6	0.2
B	0.5	0.2
Q2052		
E	11.6	11.6
C	11.2	0
B	10.8	11.5
Q2053		
E	0	0
C	0	11.5
B	4.9	0
Q2054		
E	11.2	0
C	10.8	0
B	10.4	0.7
Q2055		
E	0	0
C	0	0.6
B	4.9	0
Q2103		
E	-	-
C	-	-
B	-	-
CN1		
1	0	0
2	0	0
3	0	0
4	0	0
5	2.4	2.2
6	2.4	2.2
7	2.4	2.2
8	2.4	2.2
9	2.5	0
10	2.5	0
11	2.5	0
CN2001		
1	0	0
2	0	0
3	0	0
4	0	0
5	0	0
6	2.3	2.4
7	2.5	2.3
CN2002		
1	0	0
2	0	0

<FMA>

MODE PIN NO.	REC	PLAY
IC2201		
1	2.4	2.4
2	0	0
3	2.4	2.4
4	0	0
5	0	0
6	2.5	2.5
7	2.0	2.0
8	0	0
9	0	0
10	0	0
11	0	0
12	2.0	2.0
13	0	0
14	0	0
15	0	0
16	2.5	2.5
17	0.5	0.3
18	2.5	2.5
19	2.5	2.5
20	2.5	0
21	2.5	0
22	2.5	0.6
23	0	0
24	2.6	0.6
25	5.0	5.0
26	2.6	0
27	2.5	2.5
28	4.3	0
29	4.2	1.9
30	4.3	1.9
31	1.0	3.2
32	2.5	2.5
33	2.5	2.5
34	0.7	0.3
35	2.5	2.5
36	0	0
37	1.7	1.7
38	0	0
39	0	0
40	5.0	5.0
41	0	0
42	4.6	4.6
43	4.7	4.7
44	3.3	3.3
45	0	0
46	4.9	4.9
47	2.5	2.5
48	2.5	2.5
49	0.2	0.2
50	0.9	0.9
51	0	0
52	0	0
53	4.5	4.5
54	0	0
55	0	0
56	0	0
57	4.5	4.5
58	8.8	8.8
59	4.6	4.6
60	0.2	0.2
61	2.5	2.5
62	2.4	2.4
63	4.6	4.6
64	4.7	4.7
Q2152		
E	5.0	5.0
C	4.9	4.9
B	0	0
Q2201		
E	0	0
C	0	0
B	-0.2	-0.2
Q2202		
E	0	0
C	0	0
B	-0.2	-0.2
Q2203		
E	5.0	5.0
C	0	0
B	5.0	5.0
Q2204		
E	0	0
C	5.0	5.0
B	0	0

<SYSCON>

MODE PIN NO.	REC	PLAY
IC3001		
1	-	-
2	-	-
3	0.6	0.6
4	1.2	1.2
5	5.1	5.1
6	0	0
7	0	0
8	0	0
9	0	0
10	5.1	5.1
11	5.1	5.1
12	0	0
13	5.0	5.0
14	4.9	4.9
15	5.0	5.0
16	4.9	4.9
17	4.6	4.6
18	4.6	4.6
19	5.1	5.1
20	0.5	0.5
21	2.3	2.3
22	5.0	5.0
23	2.5	2.5
24	0	0
25	5.1	5.1
26	2.5	2.5
27	5.0	0
28	5.0	0
29	0	5.0
30	0	0
31	0	0
32	5.0	5.0
33	2.5	2.5
34	1.2	1.2
35	0	0
36	5.0	5.0
37	-	-
38	-	-
39	0	0
40	-	-
41	-	-
42	5.0	5.0
43	5.0	5.0
44	0	0
45	0	0
46	5.0	5.0
47	2.3	2.3
48	0	0
49	2.2	2.2
50	2.5	2.5
51	5.0	5.0
52	2.4	2.4
53	2.6	2.6
54	0	0
55	0	0
56	3.8	3.8
57	3.9	3.9
58	0	0
59	5.1	5.1
60	5.1	5.1
61	0	0
62	0	0
63	0	0
64	0	0
65	2.7	2.7
66	0.3	0.3
67	2.4	2.4
68	2.4	2.4
69	2.4	2.4
70	2.3	2.3
71	0	0
72	2.3	2.3
73	4.8	4.8
74	2.9	2.4
75	1.9	2.3
76	2.4	2.4
77	0	0.6
78	0	0
79	0	0
80	0	0
81	4.3	0
82	0	3.5
83	5.0	5.0
84	5.0	5.0
85	2.3	2.3
86	4.9	4.9
87	0	0
88	0	0
89	0	0
90	5.1	5.1
91	0	0
92	5.0	0
93	0	0
94	4.7	4.7
95	3.8	3.8
96	4.3	4.3
97	4.5	0.6
98	5.0	5.0
99	0	0
100	0	0
IC3002		
1	0	0
2	12.3	12.3
3	0.5	0.8
4	-	-
5	0	0
6	12.3	12.3
7	0.6	0.7
8	12.1	12.1
9	0	0
IC3003		
1	5.0	5.0
2	5.0	5.0
3	0	0
IC3004		
1	0	0
2	0	0
3	0	0
4	0	0
5	4.6	4.6
6	4.6	4.6
7	0	0
8	5.1	5.1
Q3001		
E	0	0
C	5.0	5.0
Q3002		
E	0	0
C	5.0	5.0
Q3003		
E	0	0
C	12.1	12.1
B	0.6	0.6
Q3004		
E	0	0
C	0	0
B	0.7	0.7
Q4001		
E	0	0
C	0	0
B	4.9	4.9
Q4002		
E	4.8	4.8
C	5.7	5.7
B	5.5	5.5
CN3001		
1	0	0
2	2.5	2.5
3	2.5	2.5
4	5.0	5.0
5	0	0
6	5.0	5.0
7	-	-
8	12.3	12.3
CN3002		
1	12.3	12.3
2	0	0
3	1.4	1.4
4	0.2	0.2
5	2.7	2.7
CN3003		
1	0.7	0.5
2	0.7	0.5
CN3004		
1	5.1	5.1
2	5.1	5.1
3	0	0
4	0	0

<SW.REG>

MODE PIN NO.	REC	PLAY
IC5301		
1	5.9	5.9
2	5.1	5.1
3	4.8	4.8
4	0	0
5	12.3	12.3
6	11.6	11.6
7	12.3	12.3
8	12.3	12.3
9	1.2	1.2
10	10.9	10.9
Q5101		
S	-	-
D	96.3	93.6
G	-	-
Q5102		
E	0	0
C	-	-
B	-	-

<TUNER>

MODE PIN NO.	REC	PLAY
IC6501		
1	8.9	8.9
2	4.4	4.4
3	4.4	4.4
4	4.4	4.4
5	4.4	4.4
6	4.4	4.4
7	4.4	4.4
8	4.3	4.3
9	5.5	5.5
10	3.5	3.5
11	3.0	3.0
12	4.4	4.4
13	4.4	4.4
14	0	0
15	4.6	4.6
16	4.6	4.6
17	0	0
18	4.4	4.4
19	4.5	4.5
20	4.5	4.5
21	1.2	1.2
22	5.1	5.1
23	5.1	5.1
24	4.4	4.4
25	4.4	4.4
26	4.4	4.4
27	4.4	4.4
28	3.5	3.5
Q6030		
E	2.3	2.3
C	0	0
B	1.7	1.7
Q6551		
E	8.9	8.9
C	11.5	11.5
B	9.6	9.6

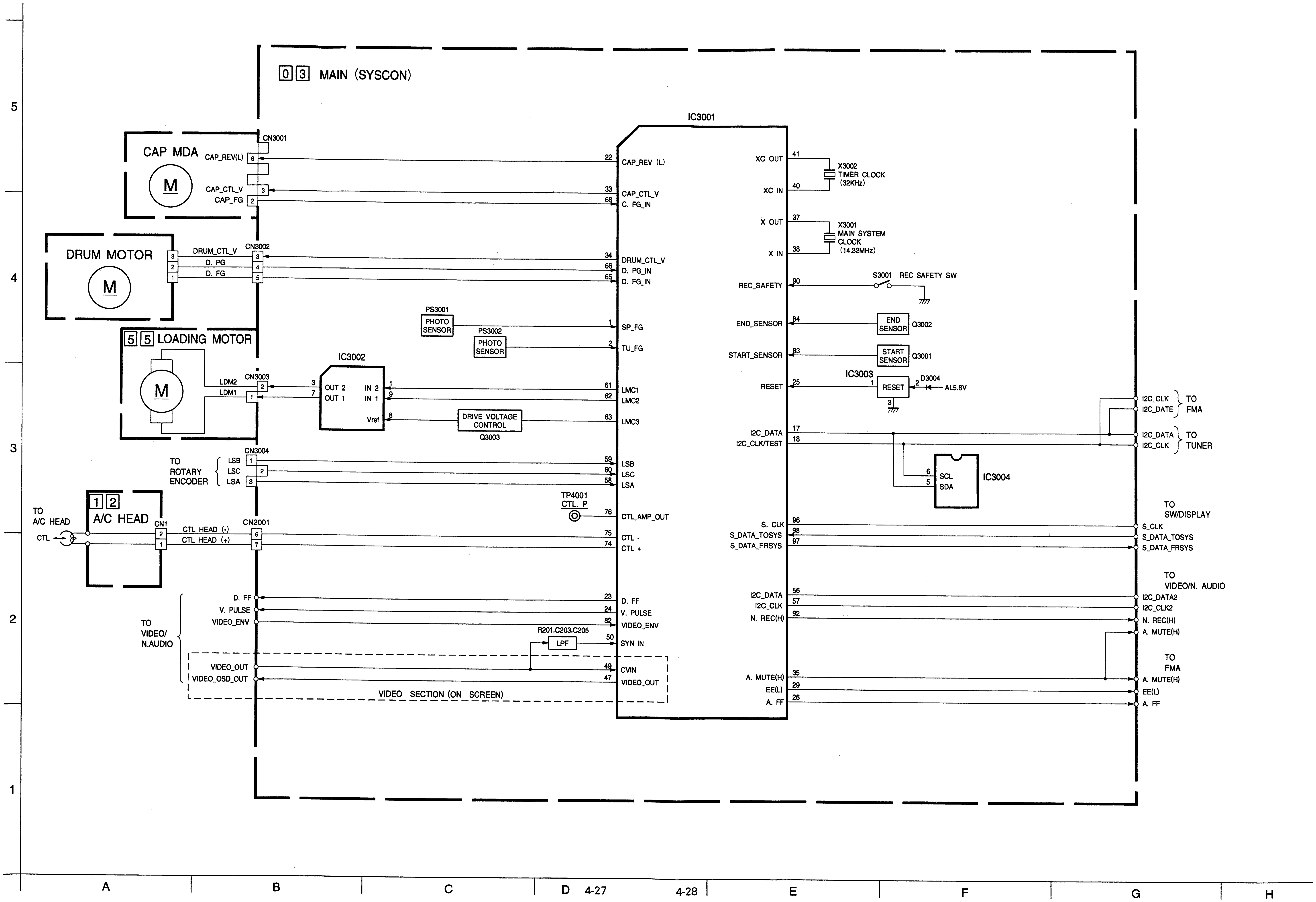
<SW/DISPLAY>

MODE PIN NO.	REC	PLAY
IC7001		
1	5.1	5.1
2	2.1	2.1
3	0	0
4	2.1	2.1
5	5.0	5.0
6	5.0	5.0
7	5.0	5.0
8	5.0	5.0
9	5.0	5.0
10	5.1	5.1
11	5.1	5.1
12	4.0	4.0
13	4.4	0.5
14	4.8	4.8
15	4.3	4.3
16	-28.5	-28.5
17	-28.5	-28.5
18	-28.3	-28.3
19	-28.3	-28.3
20	-28.3	-28.3
21	-24.1	-24.1
22	-	-
23	-	-
24	-	-
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30	-	-
31	-	-
32	-	-
33	-	-
34	-	-
35	-	-
36	-	-
37	-	-
38	-	-
39	-	-
40	-	-
41	-	-
42	-	-
43	-	-
44	5.0	5.0
IC7002		
1	5.1	5.1
2	5.1	5.1
3	0	0

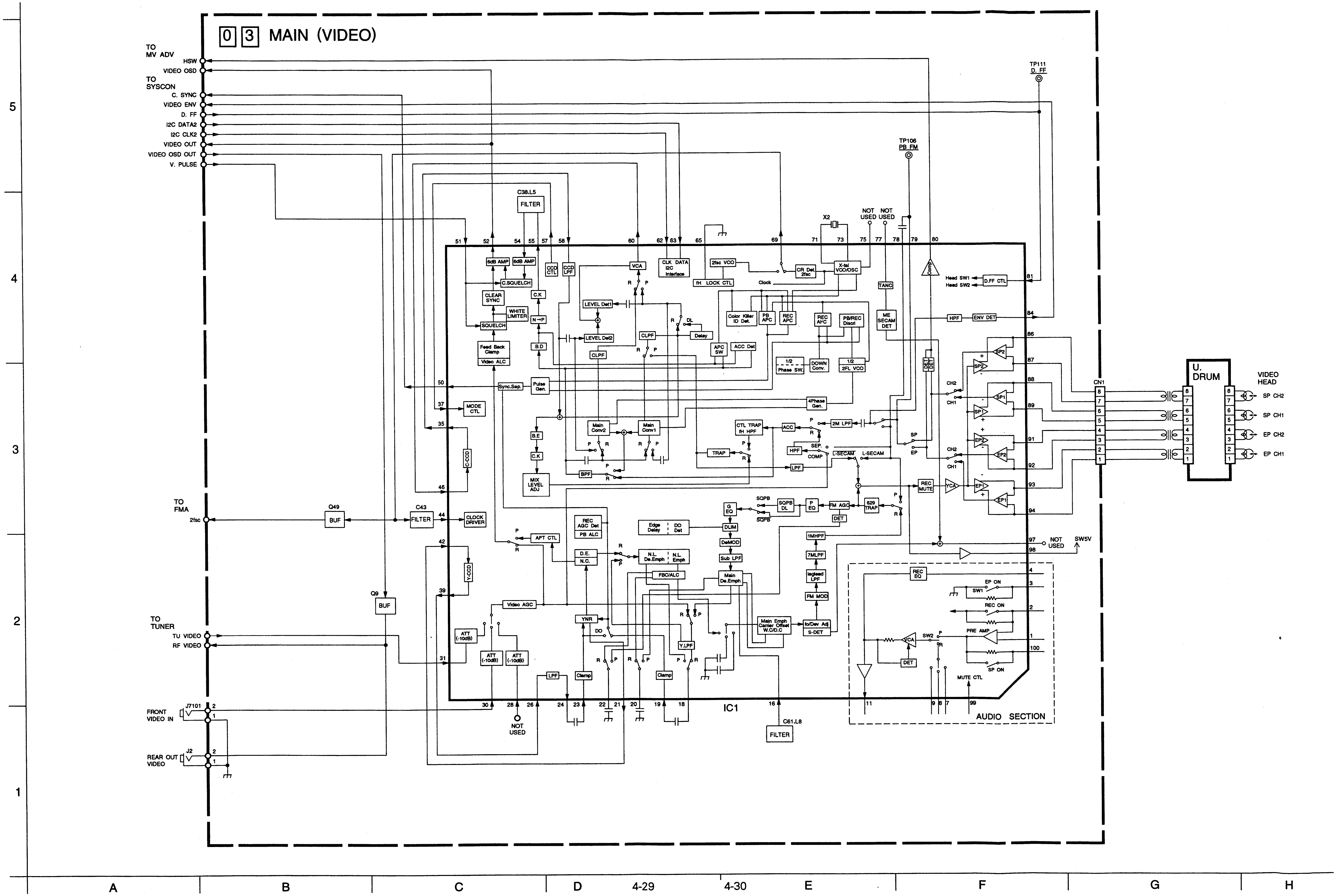
<MOVIE ADVANCE>

MODE PIN NO.	REC	PLAY
IC7401		
1	5.0	5.0
2	1.1	1.1
3	2.9	2.9
4	2.9	2.9
5	2.2	2.2
6	1.1	1.1
7	3.0	3.0
8	0.8	0.8
9	1.3	1.3
10	2.9	2.9
11	3.9	3.9
12	0.9	0.9
13	0.9	0.9
14	1.1	1.1
15	2.7	2.7
16	1.3	1.3
17	2.8	2.8
18	0.6	0.6
19	2.8	2.8
20	1.6	1.6
21	3.1	3.1
22	1.6	1.6
23	0	0
24	1.7	1.7
25	3.8	3.8
26	0	0
27	2.3	2.3
28	2.8	2.8
29	2.4	2.4
30	2.4	2.4
31	2.6	2.6
32	2.2	2.2
33	2.7	2.7
34	2.9	2.9
35	0	0
36	0	0
Q7401		
E	-	-
C	-	-
B	-	-
Q7402		
E	-	-
C	-	-
B	-	-

4.13 SYSTEM CONTROL BLOCK DIAGRAM

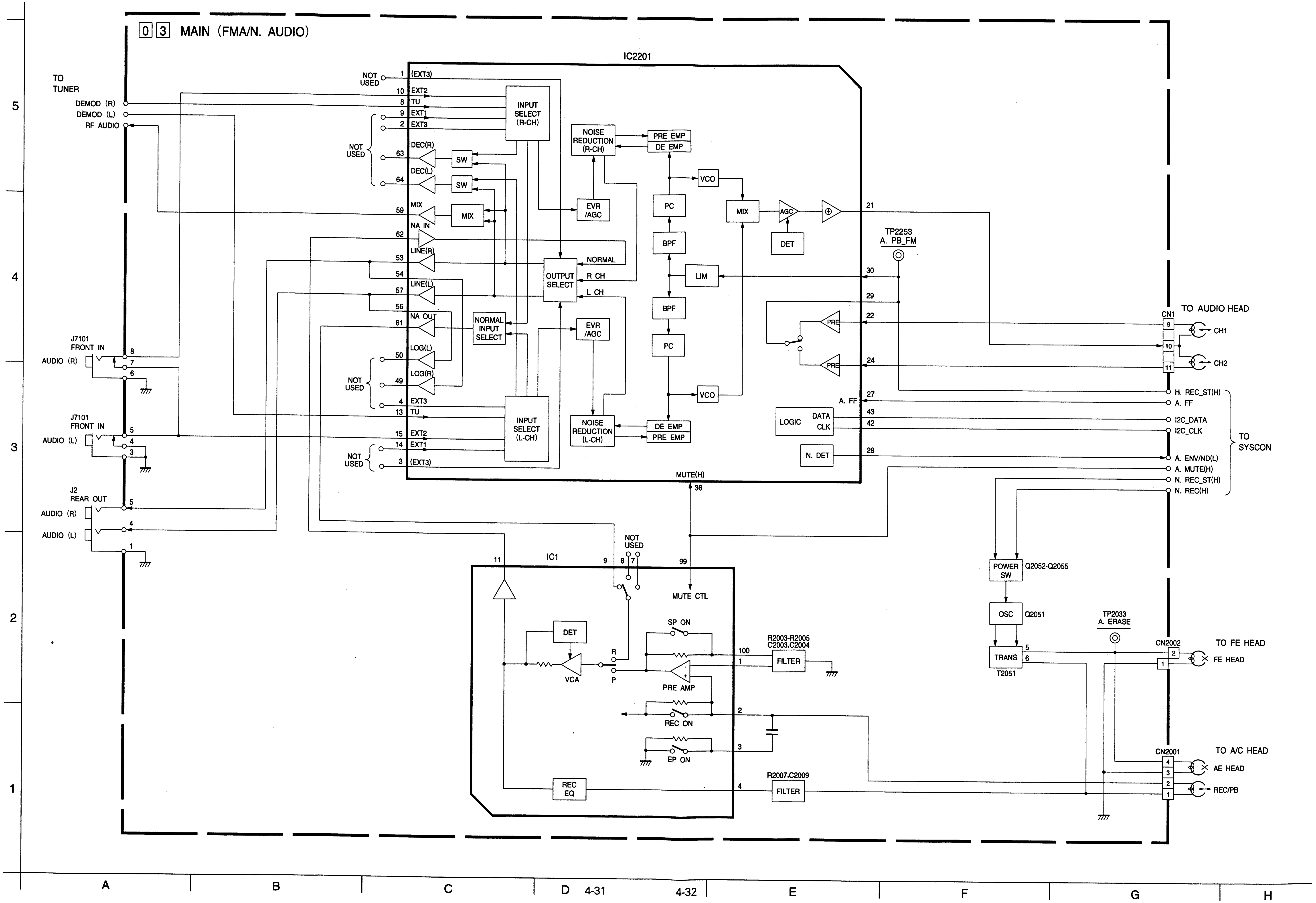

03 MAIN (SYSCON)
IC3001
CAP MDA
M
CN3001
CAP_REV(L)
CAP_CTL_V
CAP_FG
CAP_REV (L)
CAP_CTL_V
C. FG_IN
DRUM MOTOR
CN3002
DRUM_CTL_V
D. PG
D. FG
DRUM_CTL_V
D. PG_IN
D. FG_IN
PS3001
PHOTO SENSOR
PS3002
PHOTO SENSOR
SP_FG
TU_FG
55 LOADING MOTOR
IC3002
CN3003
LDM2
LDM1
OUT 2
OUT 1
IN 2
IN 1
Vref
DRIVE VOLTAGE CONTROL
Q3003
LMC1
LMC2
LMC3
CN3004
TO ROTARY ENCODER
LSB
LSC
LSA
TP4001
CTL. P
CTL_AMP_OUT
TO A/C HEAD
CTL
12 A/C HEAD
CN1
CN2001
CTL HEAD (-)
CTL HEAD (+)
CTL -
CTL +
TO VIDEO/ N.AUDIO
D. FF
V. PULSE
VIDEO_ENV
R201,C203,C205
LPF
SYN IN
VIDEO_OUT
VIDEO_OSD_OUT
CVIN
VIDEO_OUT
VIDEO SECTION (ON SCREEN)
XC OUT
XC IN
X3002
TIMER CLOCK
(32KHz)
X OUT
X IN
X3001
MAIN SYSTEM CLOCK
(14.32MHz)
REC_SAFETY
S3001 REC SAFETY SW
END_SENSOR
END SENSOR
Q3002
START_SENSOR
START SENSOR
Q3001
RESET
IC3003
RESET
D3004
AL5.8V
I2C_DATA
I2C_CLK/TEST
IC3004
SCL
SDA
I2C_CLK
I2C_DATE
TO FMA
I2C_DATA
I2C_CLK
TO TUNER
TO SW/DISPLAY
S. CLK
S_DATA_TOSYS
S_DATA_FRSYS
S_CLK
S_DATA_TOSYS
S_DATA_FRSYS
TO VIDEO/N. AUDIO
I2C_DATA
I2C_CLK
N. REC(H)
I2C_DATA2
I2C_CLK2
N. REC(H)
A. MUTE(H)
TO FMA
A. MUTE(H)
EE(L)
A. FF
A. MUTE(H)
EE(L)
A. FF
22
33
68
34
66
65
1
2
61
62
63
59
60
58
76
75
74
23
24
82
50
49
47
41
40
37
38
90
84
83
25
17
18
6
5
96
98
97
56
57
92
35
29
26
5
4
3
2
1
A
B
C
D
E
F
G
H

4.14 VIDEO BLOCK DIAGRAM



03 MAIN (VIDEO)
TO MV ADV
HSW
VIDEO OSD
TO SYSCON
C. SYNC
VIDEO ENV
D. FF
I2C DATA2
I2C CLK2
VIDEO OUT
VIDEO OSD OUT
V. PULSE
C38.L5
FILTER
TP111
D. FF
TP106
PB FM
X2
NOT USED
NOT USED
6dB AMP
6dB AMP
CCD CTL
CCD LPF
C.SQUELCH
CLEAR SYNC
WHITE LIMITER
C.K
N→P
SQUELCH
Feed Back Clamp
Video ALC
B.D
VCA
CLK DATA I2C Interface
2fsc VCO
fH LOCK CTL
Clock
CR Det 2fsc
X-tal VCO/OSC
TANC
Head SW1
Head SW2
D.FF CTL
LEVEL Det1
LEVEL Det2
DL
Delay
CLPF
CLPF
Color Killer ID Det.
PB APC
REC APC
REC AFC
PB/REC Discri
ME SECAM DET
HPF
ENV DET
APC SW
ACC Det
1/2 Phase SW
DOWN Conv.
1/2 2FL VCO
Sync.Sep.
Pulse Gen.
MODE CTL
4Phase Gen.
Main Conv2
Main Conv1
B.E
C.K
CTL TRAP fH HPF
ACC
2M LPF
TRAP
HPF
SEP.
COMP
L-SECAM
L-SECAM
SP
EP
LPF
BPF
MIX LEVEL ADJ
C-CCD
REC MUTE
YCA
629 TRAP
FM AGC
DET
G EQ
SQPB
SQPB DL
P EQ
REC AGC Det
PB ALC
Edge Delay
DO Det
DLIM
DeMOD
Sub LPF
Main De.Emph
APT CTL
D.E.
N.C.
N.L De.Emph
N.L Emph
FBC/ALC
1MHPF
7MLPF
lag lead LPF
FM MOD
fo/Dev Adj
S-DET
Main Emph Carrier Offset W.C/D.C
Y-CCD
Video AGC
YNR
DO
Y.LPF
ATT (-10dB)
ATT (-10dB)
ATT (-10dB)
LPF
Clamp
Clamp
IC1
C61.L8
FILTER
NOT USED
REC EQ
EP ON
SW1
REC ON
PRE AMP
SW2
VCA
DET
SP ON
MUTE CTL
AUDIO SECTION
NOT USED
SW5V
SP2
SP2
SP1
SP1
EP2
EP2
EP1
EP1
CH2
CH1
CH2
CH1
CN1
U. DRUM
VIDEO HEAD
SP CH2
SP CH1
EP CH2
EP CH1
TO FMA
2fsc
Q49
BUF
C43
FILTER
CLOCK DRIVER
Q9
BUF
TO TUNER
TU VIDEO
RF VIDEO
J7101
FRONT VIDEO IN
J2
REAR OUT VIDEO
51 52 54 55 57 58 60 62 63 65 69 71 73 75 77 78 79 80 81 84 86 87 88 89 91 92 93 94 97 98
50 37 35 46 44 42 39 31
30 28 26 24 23 22 21 20 19 18 16 11 9 8 7 99
4 3 2 1 100
5
4
3
2
1
A
B
C
D
E
F
G
H

4.15 AUDIO BLOCK DIAGRAM


0 3 MAIN (FMA/N. AUDIO)
IC2201
TO TUNER
DEMOD (R)
DEMOD (L)
RF AUDIO
NOT USED
1 (EXT3)
10 EXT2
8 TU
9 EXT1
2 EXT3
INPUT SELECT (R-CH)
NOISE REDUCTION (R-CH)
PRE EMP
DE EMP
DEC(R)
63
SW
DEC(L)
64
SW
VCO
MIX
59
MIX
EVR /AGC
PC
MIX
AGC
21
NA IN
62
DET
BPF
TP2253
A. PB_FM
LINE(R)
53
NORMAL
OUTPUT SELECT
R CH
L CH
LIM
30
54
LINE(L)
57
29
56
BPF
NA OUT
61
NORMAL INPUT SELECT
EVR /AGC
PRE
22
CN1
TO AUDIO HEAD
9
CH1
10
J7101 FRONT IN
AUDIO (R)
8
7
6
LOG(L)
50
PC
PRE
24
11
CH2
LOG(R)
49
NOT USED
4 EXT3
VCO
A. FF
27
H. REC_ST(H)
A. FF
J7101 FRONT IN
13 TU
INPUT SELECT (L-CH)
NOISE REDUCTION (L-CH)
DE EMP
PRE EMP
LOGIC
DATA
CLK
43
42
I2C_DATA
I2C_CLK
TO SYSCON
AUDIO (L)
5
4
3
15 EXT2
14 EXT1
3 (EXT3)
N. DET
28
A. ENV/ND(L)
A. MUTE(H)
N. REC_ST(H)
N. REC(H)
MUTE(H)
36
J2 REAR OUT
AUDIO (R)
5
AUDIO (L)
4
1
NOT USED
IC1
11
9
8
7
99
MUTE CTL
POWER SW
Q2052-Q2055
OSC
Q2051
TP2033
A. ERASE
DET
SP ON
R2003-R2005 C2003,C2004
100
FILTER
CN2002
TO FE HEAD
2
FE HEAD
R
1
TRANS
5
6
1
VCA
P
PRE AMP
T2051
2
REC ON
3
EP ON
CN2001
TO A/C HEAD
4
AE HEAD
3
R2007,C2009
2
REC EQ
4
FILTER
1
REC/PB
5
4
3
2
1
A
B
C
D
E
F
G
H

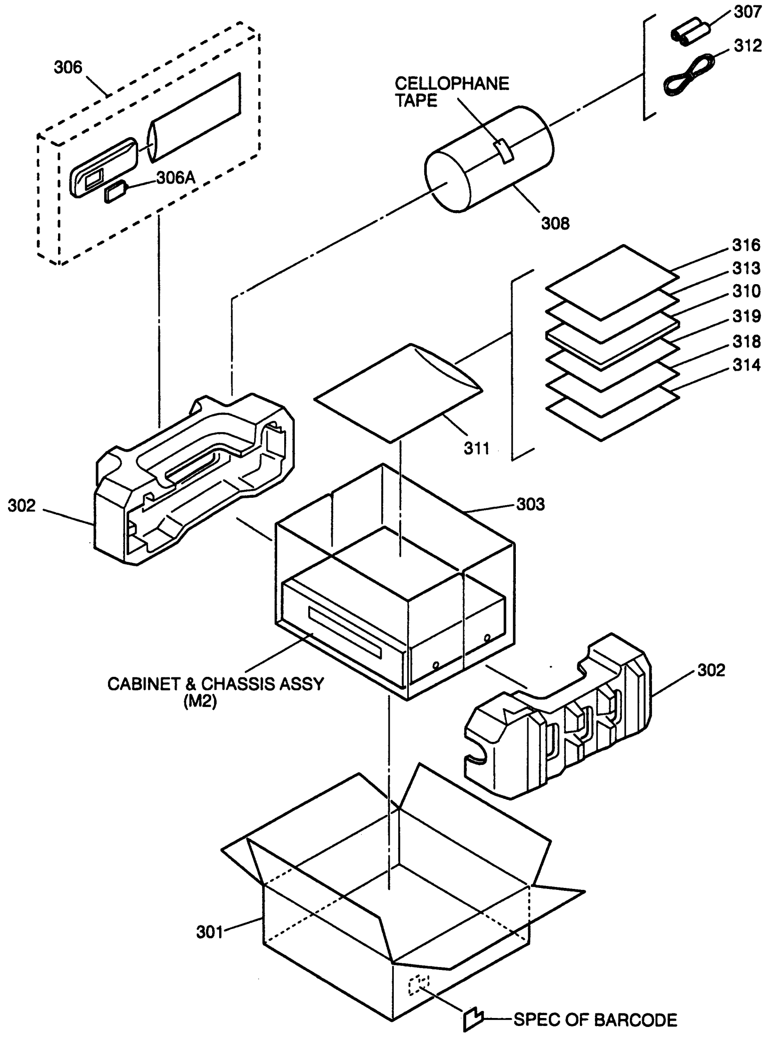
SECTION 5
PARTS LIST

SAFETY PRECAUTION

Parts identified by the ⚠ symbol are critical for safety. Replace only with specified part numbers.

5.1 PACKING AND ACCESSORY ASSEMBLY <M1>

The instruction manual to be provided with this product will differ according to the destination.

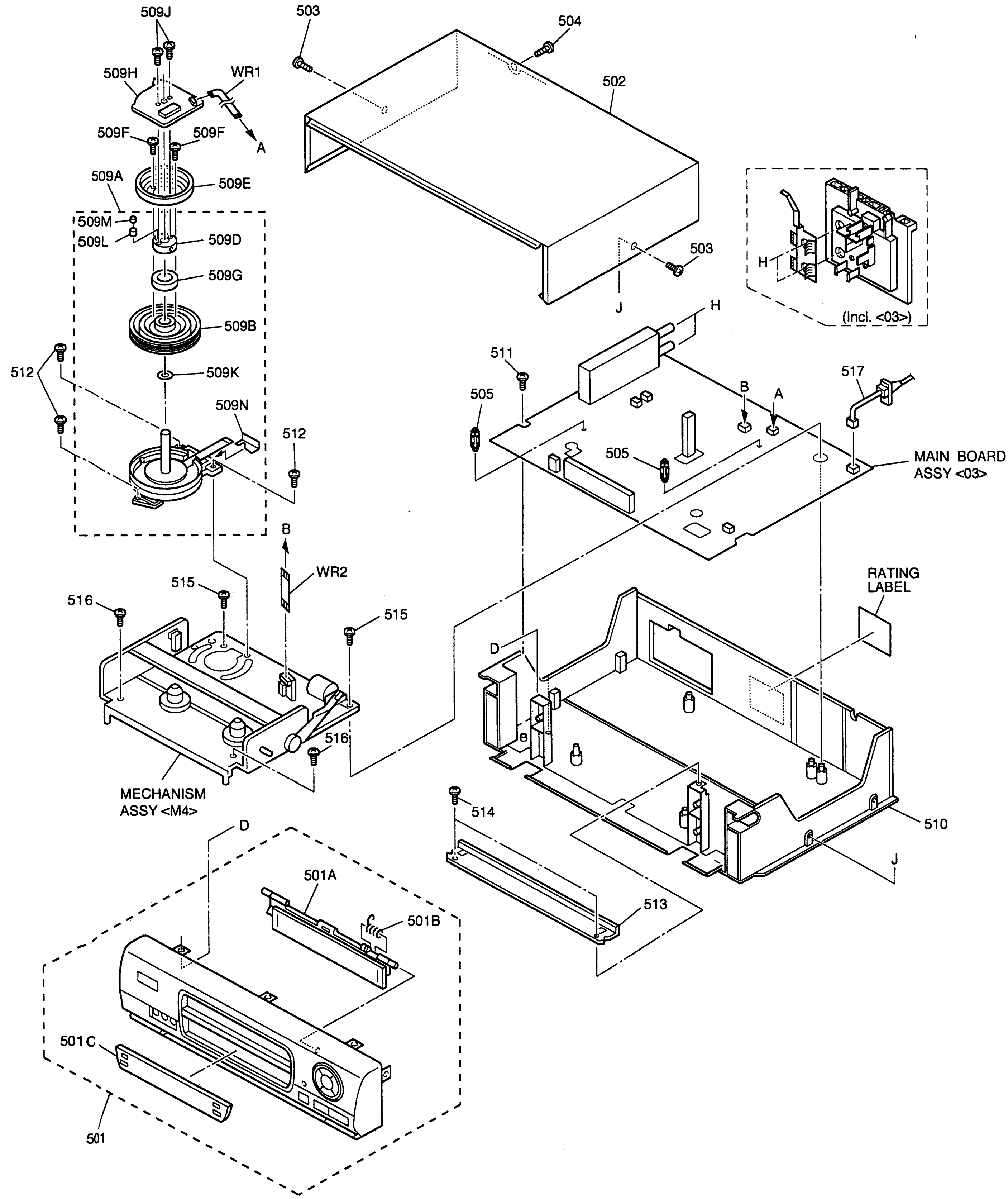


# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION
*******************************			
PACKING AND ACCESSORY ASSEMBLY <M1>			
	301	LP30535-007A	PACKING CASE,VP670U
		LP30535-009A	PACKING CASE,VP670U(C)
		LP30535-011A	PACKING CASE,VP672U
		LP30535-013A	PACKING CASE,VP673U
		LP30535-015A	PACKING CASE,VP673U(C)
	302	LP30536-001B	CUSHION ASSY
	303	PQM30021-93	POLY BAG
	306	LP20303-008A	REMOTE CONTROLLER
	306A	LP40225-002A	COVER(BATTERY)
	307	-	BATTERY,X2(R6P TYPE)
	308	QPC02202230P	POLY BAG
⚠	310	LPT0185-001A	INST.BOOK(EN),VP670U/U(C)
⚠		LPT0185-003A	INST.BOOK(FR),VP670U(C)
⚠		LPT0186-001A	INST.BOOK(EN),VP672U
⚠		LPT0187-001A	INST.BOOK(EN),VP673U/U(C)
⚠		LPT0187-003A	INST.BOOK(FR),VP673U(C)
	311	QPC02503530P	POLY BAG
	312	PEAC0294-04	RF CABLE
	313	BT-51006-1	REGIST.CARD,VP670U/VP672U/VP673U
	314	LPT0185-002A	Q.S.SHEET,VP670U
		LPT0186-002A	Q.S.SHEET,VP672U
		LPT0187-002A	Q.S.SHEET,VP673U
	316	BT-52002-1	WARRANTY CARD,VP670U(C)/VP673U(C)
	318	PU36560	CONECTION SHEET,VP670U(C)/VP673U(C)
	319	BT-20071B	SER.NET CARD,VP670U(C)/VP673U(C)

5.2 CABINET AND CHASSIS ASSEMBLY <M2>

BEWARE OF BOGUS PARTS

Parts that do not meet specifications may cause trouble in regard to safety and performance. We recommend that genuine JVC parts be used.



509J
503
504
509H
WR1
502
509F
509F
A
509A
509E
509M
509L
509D
503
509G
H
J
H
509B
(Incl. <03>)
511
517
512
509K
505
B
A
509N
512
505
MAIN BOARD ASSY <03>
B
WR2
RATING LABEL
515
516
515
D
516
MECHANISM ASSY <M4>
514
510
D
J
501A
501B
513
501C
501

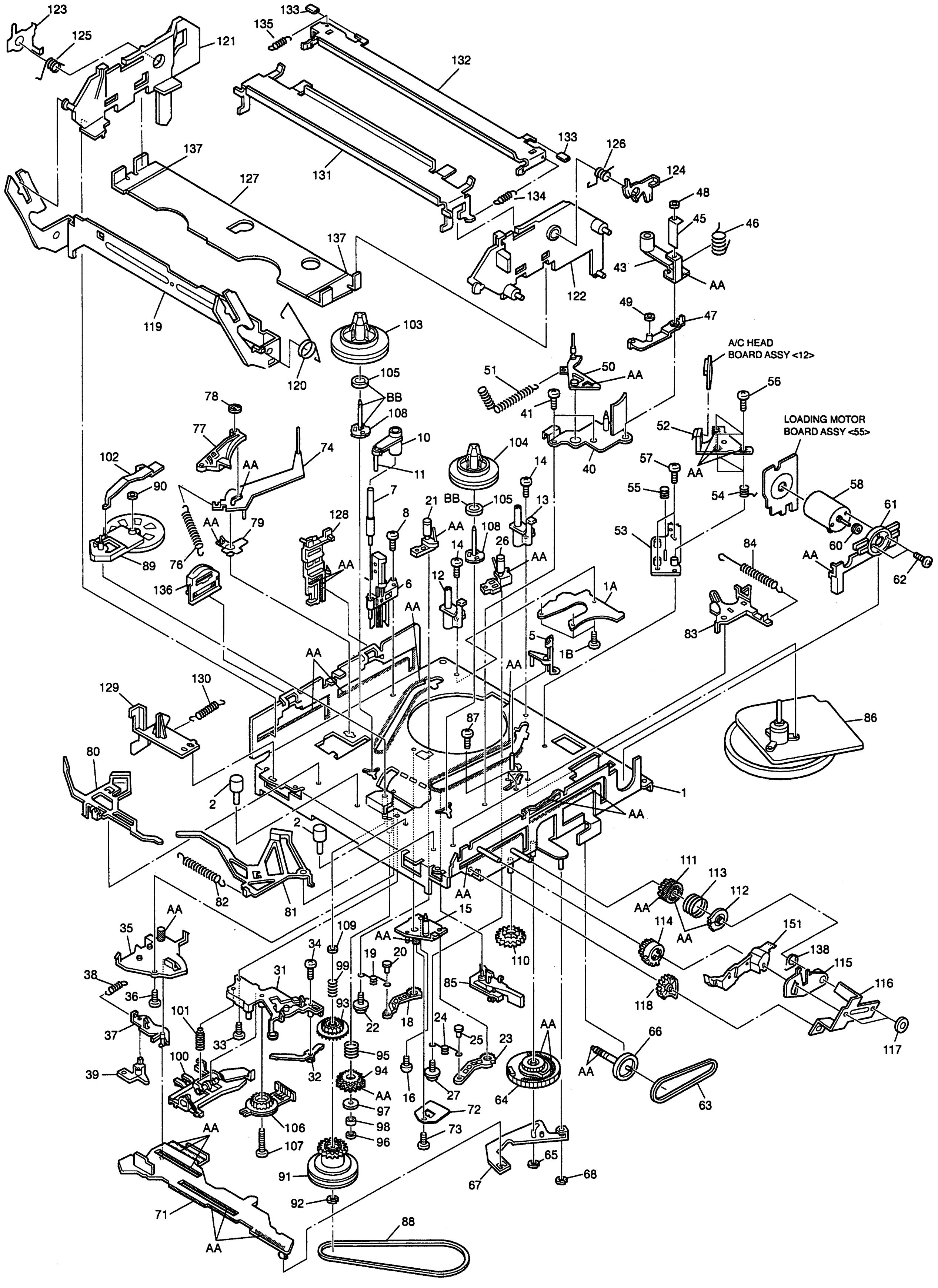
#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION

* * *

CABINET AND CHASSIS ASSEMBLY <M2>

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION
	⚠	501	LP10212-009B	FRONT PANEL ASSY,VP670U/U(C)
	⚠		LP10212-010B	FRONT PANEL ASSY,VP672U
	⚠		LP10212-011B	FRONT PANEL ASSY,VP673U/U(C)
		501A	PQ21884-121	CASSETTE DOOR,VP670U
			PQ21884-127-23	CASSETTE DOOR,VP672U,VP673U/U(C)
		501B	PQ46448	TORSION SPRING
		501C	LP20326-041A	DISPLAY WINDOW,VP670U/U(C)
			LP20326-042A	DISPLAY WINDOW,VP672U
			LP20326-043A	DISPLAY WINDOW,VP673U/(C)
	⚠	502	LP10013-021B	TOP COVER
		503	QYTDSF3010M	SCREW,X2 TOP COVER(SIDE)
		504	QYTDSF3010M	SCREW,TOP COVER(REAR)
		505	LP40226-001A	PC SUPPORT,X2
		509A	LP20617-001A	DRUM SUB ASSY
		509B	LP20616-001A	UPPER DRUM ASSY
		509D	LP40028-001A	COLLAR ASSY
		509E	PDZ0179-1-4	ROTOR ASSY
		509F	QYSPSP3006Z	SCREW,X2
		509G	PDM4439	CAP
		509H	PDZ0180-1-2	STATOR ASSY
		509J	QYSPSPL2607Z	SCREW,X2
		509K	PDM4444-19-2	WASHER
		509L	LP40323-001A	CONTACT
		509M	LP30004-005A	COMPRES. SPRING
		509N	LP40174-001B	FPC PLATE
	⚠	510	LP10108-008B	BOTTOM CHASSIS
		511	QYTDSF3010Z	SCREW,MAIN
		512	QYSDST2610Z	SCREW,X3 DRUM
		513	LP30312-001B	BRACKET(CHASSIS)
		514	QYTDSF3010Z	SCREW,X2 BRACKET(CHASSIS)
		515	QYTDSF4012Z	SCREW,X2 MECHA
		516	QYTDSF3010Z	SCREW,X2 MECHA
	⚠	517	QMPD190-170-K	POWER CORD
		WR1	QUQ212-0518CG	FFC WIRE,DRUM CN3007
		WR2	WJT0005-002A	E-CARD WIRE,A/C HEAD CN2001

5.3 MECHANISM ASSEMBLY <M4>


123
133
125
135
121
132
133
126
137
124
127
131
48
134
45
46
137
43
122
AA
49
47
119
103
A/C HEAD
BOARD ASSY <12>
120
105
51
50
AA
56
78
BB
108
41
LOADING MOTOR
BOARD ASSY <55>
77
10
74
104
52
102
AA
11
14
40
AA
57
90
7
BB
105
13
55
58
21
54
61
128
8
AA
108
53
84
AA
79
14
26
60
AA
89
76
AA
62
12
AA
6
1A
136
AA
83
5
AA
1B
AA
130
129
87
86
80
1
2
AA
2
111
113
82
81
112
AA
AA
15
114
AA
151
35
109
AA
34
138
19
20
99
115
38
31
110
116
36
85
101
93
22
18
118
24
25
23
AA
66
37
33
117
100
95
32
94
AA
39
16
27
64
63
AA
97
72
106
98
73
96
107
AA
65
91
68
67
92
88
71
AA

Classifi-cation	Part No.	Symbol in drawing
Grease	KYODO-SH-P	AA
Oil	COSMO-HV56	BB

NOTE: The section marked in AA and BB indicate lubrication and greasing areas.

****

MECHANISM ASSEMBLY <M4>

# ⚠ REF No.	PART No.	PART NAME, DESCRIPTION
1	LP20228-008F	MAIN DECK ASSY
1A	LP40275-002A	PLATE(S)
1B	QYTDST2606Z	SCREW,X3 PLATE(SUPPLY)
2	PQ46302-1-3	ADJUST PIN,X2
5	LP30492-002A	GUIDE POLE GUARD
6	NAH0001-001	FULL ERASE HEAD
7	LP40098-001B	GUIDE POLE(SUPPLY)
8	QYTDST2608Z	SCREW,FE HEAD
10	LP30459-001A	TENSION STUD BASE
11	LP40367-002A	TENSION STUD
12	LP40096-001B	UV CATCHER(SUPPLY)
13	LP40536-001A	UV CATCHER ASSY(TAKE UP)
14	QYTPST2606Z	SCREW,X2 UV CATCHER
15	LP30223-003C	LOADING ARM GEAR SHAFT
16	QYTDST2606Z	SCREW
18	LP30224-001A	LOADING ARM GEAR(SPPLY)
19	LP40099-001A	TORSION ARM
20	LP40100-001A	PIN
21	LP40101-002A	POLE BASE ASSY(SUPPLY)
22	QYSPSTG2606Z	SCREW
23	LP40103-002A	LOADING ARM GEAR(TAKE UP)
24	LP40523-001A	TORSION ARM
25	LP40100-001A	PIN
26	LP40104-002A	POLE BASE ASSY(TAKE UP)
27	QYSPSTG2606Z	SCREW
31	LP20233-003H	ROTARY ENCODER GUIDE
32	LP30499-001A	BRAKE LEVER
33	QYTPST2606Z	SCREW
34	QYTPST2608Z	SCREW
35	LP30226-004B	CONTROL PLATE GUIDE
36	QYTPST2605Z	SCREW
37	LP30249-003B	TAKE UP LEVER
38	LP30003-006A	TENSION SPRING
39	LP40119-002A	T.UP HEAD
40	LP20234-004B	LID GUIDE
41	QYTDST2606Z	SCREW,X2
43	LP40105-001B	PINCH ROLLER ARM ASSY
45	LP40478-001A	PINCH ROLLER SHEET2
46	LP40148-002A	TORSION SPRING
47	LP40149-001B	P.LEVER ASSY
48	LP30016-002A	SLIT WASHER
49	LP40404-001A	SPACER,P.LEVER ASSY
50	LP40106-001F	GUIDE ARM ASSY
51	LP40134-001B	TENSION SPRING
52	QAH0010-004	AC HEAD
53	LP30228-001A	HEAD BASE
54	LP30004-013A	COMPRESSION SPRING,X3
55	LP40236-001A	COMPRESSION SPRING
56	LP40213-002B	SPECIAL SCREW,X3
57	QYTDST2608Z	SCREW,X2
58	QAR0023-001	LOADING MOTOR
60	PQ43546-1-2	MOTOR PULLEY
61	LP30230-003A	MOTOR GUIDE
62	QYTPSP3003Z	SCREW,X2
63	LP30005-003A	BELT,LOADING MOTOR
64	LP30229-001F	CONTROL CAM
65	PQM30017-24	SLIT WASHER
66	LP40120-001A	WORM GEAR
67	LP40107-002A	LINK LEVER ASSY
68	PQM30017-24	SLIT WASHER
71	LP10201-001A	CONTROL PLATE
72	LP40379-001A	CTL BRACKET(1)
73	QYTDSF2608M	SCREW
74	LP40108-002A	TENSION ARM ASSY
76	LP30003-010A	TENSION SPRING
77	LP40109-002D	TENSION BRAKE ASSY
78	PQ46302-1-3	ADJUST PIN
79	LP30232-002A	T.ARM BEARING
80	LP40532-001A	MAIN BRAKE ASSY (SUPPLY)
81	LP40111-003A	MAIN BRAKE ASSY (TAKE-UP)
82	LP30003-002A	TENSION SPRING
83	LP40112-001E	SUB BRAKE ASSY(TAKE UP)
84	LP40357-002A	TENSION SPRING
85	LP40461-001A	CAPSTAN BRAKE ASSY
86	QAR0087-002	CAPSTAN MOTOR
87	QYTDSF2608M	SCREW,X3
88	LP30005-007A	BELT,CAPSTAN MOTOR
89	LP40114-006B	IDLER ARM ASSY
90	LP30016-001A	SLIT WASHER
91	LP40459-003B	CLUTCH UNIT
92	PQM30017-47	SLIT WASHER
93	LP40446-002A	CLUTCH GEAR 1
94	LP40442-001A	DIRECT GEAR
95	LP40483-002A	COMPRESSION SPRING
96	LP30016-001A	SLIT WASHER
97	LP30017-014A	SPACER,D.GEAR
98	QYWFM264713	WASHER,D.GEAR
99	LP40554-001A	COMPRESSION SPRING,C.GEAR 1
100	LP40484-001E	CHANGE LEVER ASSY
101	LP40512-003A	COMPRESSION SPRING
102	LP30236-002B	IDLER LEVER
103	LP40420-001A	REEL DISK ASSY(SUPPLY)
104	LP40421-001A	REEL DISK ASSY(TAKE-UP)
105	LP30017-015A	SPACER,X2
106	QSW0554-003	ROTARY ENCODER
107	QYTPST2620Z	SCREW
108	LP40123-001A	REEL SHAFT,X2
109	LP30017-019A	SPACER,C.GEAR 1
110	LP30237-002B	CASSETTE GEAR
111	LP30239-002F	LIMIT GEAR(1)
112	LP30240-002E	LIMIT GEAR(2)
113	LP40136-001E	TORSION SPRING
114	LP30242-001A	RELAY GEAR
115	LP30339-002D	OPENER GUIDE
116	LP40214-001A	C.H.BRACKET
117	PQM30017-47	SLIT WASHER,X2
118	LP30243-001C	DRIVE GEAR
119	LP20240-001C	DRIVE ARM
120	LP40137-001A	TORSION SPRING
121	LP10081-001G	SIDE HOLDER(L)
122	LP10082-002K	SIDE HOLDER(R)
123	LP30255-003C	LOCK LEVER(L)
124	LP30256-001E	LOCK LEVER(R)
125	LP40168-001A	TORSION SPRING(L)
126	LP40218-001B	TORSION SPRING(R)
127	LP30257-001E	CASSETTE HOLDER
128	LP30244-001F	GUIDE RAIL
129	LP30245-001C	REC SAFTY LEVER
130	LP30003-004A	TENSION SPRING
131	LP20578-001B	TOP GUIDE
132	LP30500-001C	HOLD PLATE
133	LP40450-002A	PAD,X2 HOLD PLATE
134	LP30003-025B	TENSION SPRING,H.PLATE(TAKE-UP)
135	LP30003-024A	TENSION SPRING,H.PLATE(SUPPLY)
136	LP40481-001A	ROLLER CAM ASSY
137	LP30019-014A	PAD,X2 CASSETTE HOLDER
138	LP40545-001A	TORSION SPRING,OPENER GUIDE
151	LP20324-002E	DOOR OPENER

5.4 ELECTRICAL PARTS LIST

****

MAIN BOARD ASSEMBLY <03>

#	⚠ REF No.	PART No.	PART NAME, DESCRIPTION
	PW1	LPA10051-05D1	MAIN BOARD ASSY,VP670U/U(C)
		LPA10051-06D1	MAIN BOARD ASSY,VP672U/VP673U/U(C)
	IC1	JCP8017-NVA	IC
		or JCP8017-NSA	IC
	IC2201	AN3650NFBP	IC
	IC3001	MN101D01YJB	IC
		or MN101DP01YAFJB	IC
	IC3002	TA7291S	IC
	IC3003	S-80823ANUP-W	IC
	IC3004	M24C04-BN6	IC
		or AT24C04-10PC	IC
		or 24LC04B/P	IC
	IC5301	LA5613	IC
	IC6501	UPC1854AGT	IC
	IC7001	M35500AGP	IC
		or M35500BFP	IC
		or M35500BGP	IC
	IC7002	GP1U291Q	IR DETECT UNIT
		or PNA4652M00YC	IR DETECT UNIT
	IC7401	AN3275SB	IC
	Q8	2SB1218A/QR/-X	TRANSISTOR
		or 2PA1576/R/-X	TRANSISTOR
		or 2SA1576A/QR/-X	TRANSISTOR
	Q9	2SB1218A/QR/-X	TRANSISTOR
		or 2SA1576A/QR/-X	TRANSISTOR
		or 2PA1576/R/-X	TRANSISTOR
	Q49	2SC4081/QRS/-X	TRANSISTOR
		or 2SD1819A/QRS/-X	TRANSISTOR
		or 2PC4081/R/-X	TRANSISTOR
	Q56	UN521E	TRANSISTOR
		or DTC144WU	TRANSISTOR
		or RN1309	TRANSISTOR
	Q2001	2SC4081/QRS/-X	TRANSISTOR
		or 2SD1819A/QRS/-X	TRANSISTOR
		or 2PC4081/R/-X	TRANSISTOR
	Q2002	2SC4081/QRS/-X	TRANSISTOR
		or 2PC4081/R/-X	TRANSISTOR
		or 2SD1819A/QRS/-X	TRANSISTOR
	Q2003	DTA144WU	TRANSISTOR
		or RN2309	TRANSISTOR
		or UN511E	TRANSISTOR
	Q2051	2SC4081/QRS/-X	TRANSISTOR
		or 2PC4081/R/-X	TRANSISTOR
		or 2SD1819A/QRS/-X	TRANSISTOR
	Q2052	2SA1576A/QR/-X	TRANSISTOR
		or 2SB1218A/QR/-X	TRANSISTOR
		or 2PA1576/R/-X	TRANSISTOR
	Q2053	DTC144WU	TRANSISTOR
		or RN1309	TRANSISTOR
		or UN521E	TRANSISTOR
	Q2054	2SA1576A/QR/-X	TRANSISTOR
		or 2SB1218A/QR/-X	TRANSISTOR
		or 2PA1576/R/-X	TRANSISTOR
	Q2055	DTC144WU	TRANSISTOR
		or RN1309	TRANSISTOR
		or UN521E	TRANSISTOR
	Q2103	2SD1819A/QRS/-X	TRANSISTOR
		or 2SC4081/QRS/-X	TRANSISTOR
		or 2PC4081/R/-X	TRANSISTOR
	Q2152	DTA144WU	TRANSISTOR
		or RN2309	TRANSISTOR
		or UN511E	TRANSISTOR
	Q2201	2SC4081/QRS/-X	TRANSISTOR
		or 2PC4081/R/-X	TRANSISTOR
		or 2SD1819A/QRS/-X	TRANSISTOR
	Q2202	2SC4081/QRS/-X	TRANSISTOR
		or 2SD1819A/QRS/-X	TRANSISTOR
		or 2PC4081/R/-X	TRANSISTOR
	Q2203	DTA144WU	TRANSISTOR
		or RN2309	TRANSISTOR
		or UN511E	TRANSISTOR
	Q2204	DTC144WU	TRANSISTOR
		or RN1309	TRANSISTOR
		or UN521E	TRANSISTOR
	Q3001	PTZ-NV16	PHOTO TRANSISTOR
	Q3002	PTZ-NV16	PHOTO TRANSISTOR
	Q3003	2SD1819A/QRS/-X	TRANSISTOR
		or 2PC4081/R/-X	TRANSISTOR
		or 2SC4081/QRS/-X	TRANSISTOR
	Q3004	2SD1819A/QRS/-X	TRANSISTOR
		or 2SC4081/QRS/-X	TRANSISTOR
		or 2PC4081/R/-X	TRANSISTOR
	Q4001	UN5211	TRANSISTOR
		or RN1302	TRANSISTOR
		or DTC114EU	TRANSISTOR
	Q4002	2SD1819A/QRS/-X	TRANSISTOR
		or 2PC4081/R/-X	TRANSISTOR
		or 2SC4081/QRS/-X	TRANSISTOR
	Q5101	2SK2043-CB14	FE TRANSISTOR
		or 2SK2043	FE TRANSISTOR
		or 2SK1953	FE TRANSISTOR
		or 2SK2324	POWER MOS FET
		or 2SK2324-LT	POWER MOS FET
	Q5102	2SD2144S/UV/-T	TRANSISTOR
	Q6030	2SB1218A/QR/-X	TRANSISTOR
		or 2SA1576A/QR/-X	TRANSISTOR
		or 2PA1576/R/-X	TRANSISTOR
	Q6551	2SC1740S/QRS/-T	TRANSISTOR
		or 2SC3199/YG/-T	TRANSISTOR
	Q7401	2SD1819A/QRS/-X	TRANSISTOR
		or 2PC4081/R/-X	TRANSISTOR
		or 2SC4081/QRS/-X	TRANSISTOR
	Q7402	2SB1218A/QR/-X	TRANSISTOR
		or 2SA1576A/QR/-X	TRANSISTOR
		or 2PA1576/R/-X	TRANSISTOR
	D16	1SS133	DIODE
	D17	1SS133	DIODE
	D2001	1SS133	DIODE
	D2201	11ES2	DIODE
	D2251	1SS133	DIODE
	D3001	LNB2301L01VI	LE DIODE
	D3002	1SS133	DIODE
	D3003	1SS133	DIODE
	D3004	11ES2	DIODE
	D3005	11ES2	DIODE
	D3006	RD33ES/B2/-T2	ZENER DIODE
		or MTZJ33B	ZENER DIODE
	D3009	1SS133	DIODE

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION
		D3010	1SS133	DIODE
		D3013	DA204U	DIODE
		D4003	1SS133	DIODE
		D5001	S1WB(A)60F4102	BRIDGE DIODE
			or S1WB(A)60F4072X	BRIDGE DIODE
			or S1WB(A)60F4062X	BRIDGE DIODE
		D5101	AU01	FR DIODE
			or ERA18-04-T2	FR DIODE
			or PG104RS	FR DIODE
			or 10ELS4	FR DIODE
			or 1SR153-400-T2	FR DIODE
		D5102	AU01	FR DIODE
			or ERA18-04-T2	FR DIODE
			or 10ELS4	FR DIODE
			or PG104RS	FR DIODE
			or 1SR153-400-T2	FR DIODE
		D5103	1SS133	DIODE
		D5104	MTZJ15C	ZENER DIODE
			or RD15ES/B3/-T2	ZENER DIODE
		D5201	ERA18-02-T2	FR DIODE
			or 1SR153-400-T2	FR DIODE
		D5203	AU01Z	FR DIODE
			or ERA18-02-T2	FR DIODE
			or PG104RS	FR DIODE
			or 1SR153-400-T2	FR DIODE
			or 10ELS2	FR DIODE
		D5204	AU01Z	FR DIODE
			or ERA18-02-T2	FR DIODE
			or 1SR153-400-T2	FR DIODE
			or PG104RS	FR DIODE
			or 10ELS2	FR DIODE
		D5205	AU01Z	FR DIODE
			or ERA18-02-T2	FR DIODE
			or PG104RS	FR DIODE
			or 10ELS2	FR DIODE
			or 1SR153-400-T2	FR DIODE
		D5207	AK04	DIODE
			or 11EQS04	SB DIODE
		D5210	AU01Z	FR DIODE
			or PG104RS	FR DIODE
			or 1SR153-400-T2	FR DIODE
			or 10ELS2	FR DIODE
			or ERA18-02-T2	FR DIODE
		D5211	AU01Z	FR DIODE
			or ERA18-02-T2	FR DIODE
			or PG104RS	FR DIODE
			or 10ELS2	FR DIODE
			or 1SR153-400-T2	FR DIODE
		D5301	MTZJ15A	ZENER DIODE
			or RD15ES/B1/-T2	ZENER DIODE
		D5302	MTZJ6.8A	ZENER DIODE
			or RD6.8ES/B1/-T2	ZENER DIODE
		D5303	MTZJ30A	ZENER DIODE
			or RD30ES/B1/-T2	ZENER DIODE
		D5304	1SS133	DIODE
		D5306	MTZJ6.8A	ZENER DIODE
			or RD6.8ES/B1/-T2	ZENER DIODE
		D5311	MTZJ5.1C	ZENER DIODE
			or RD5.1ES/B3/-T2	ZENER DIODE
		D6002	HZ30-2L-T2	ZENER DIODE
			or HZ30-2LTD	Z DIODE (M)

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		D6551	MTZJ10B	ZENER DIODE	
		D7002	RD9.1ES/B2/-T2	ZENER DIODE	
			or UZ9.1BSB	ZENER DIODE	
			or MTZJ9.1B	ZENER DIODE	
		R1	NRSA02J-561X	MG RESISTOR	560Ω,1/10W
		R2	NRSA02J-821X	MG RESISTOR	820Ω,1/10W
		R3	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R11	NRSA02J-561X	MG RESISTOR	560Ω,1/10W
		R23	NRSA02J-822X	MG RESISTOR	8.2kΩ,1/10W
		R24	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R25	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R26	NRSA02J-153X	MG RESISTOR	15kΩ,1/10W
		R27	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R28	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R29	QRE123J-331X	RESISTOR	330Ω,1/2W
		R30	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R31	NRSA02J-750X	MG RESISTOR	75Ω,1/10W
		R44	NRSA02J-331X	MG RESISTOR	330Ω,1/10W
		R52	QRE141J-682Y	RESISTOR	6.8kΩ,1/4W
		R170	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R171	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R196	NRSA02J-683X	MG RESISTOR	68kΩ,1/10W
		R201	NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W
		R202	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R2001	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R2002	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R2003	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R2004	NRSA02J-224X	MG RESISTOR	220kΩ,1/10W
		R2005	NRSA02J-181X	MG RESISTOR	180Ω,1/10W
		R2006	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R2007	NRSA02J-153X	MG RESISTOR	15kΩ,1/10W
		R2013	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R2018	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2019	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2053	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2054	NRSA02J-123X	MG RESISTOR	12kΩ,1/10W
		R2055	NRSA02J-3R3X	MG RESISTOR	3.3Ω,1/10W
		R2056	QRE141J-820Y	RESISTOR	82Ω,1/4W
		R2057	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2058	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R2059	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2060	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R2106	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R2107	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R2206	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R2208	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2209	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R2211	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R2212	NCB21HK-392X	CAPACITOR	0.0039µF,50V
		R2214	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R2215	NCB21HK-392X	CAPACITOR	0.0039µF,50V
		R2217	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R2218	QRE141J-221Y	RESISTOR	220Ω,1/4W
		R2219	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R2220	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R2221	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R2222	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R2223	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R2225	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R2226	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R2227	NRSA02J-471X	MG RESISTOR	470Ω,1/10W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		R2236	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2237	NRSA02J-511X	MG RESISTOR	510Ω,1/10W
		R2239	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R2240	NRSA02J-511X	MG RESISTOR	510Ω,1/10W
		R2241	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R2242	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R2243	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R2251	NRSA02J-333X	MG RESISTOR	33kΩ,1/10W
		R2252	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R2253	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R2602	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R2605	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R2607	QRE141J-101Y	RESISTOR	100Ω,1/4W
		R2608	QRE141J-101Y	RESISTOR	100Ω,1/4W
		R2609	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3001	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3002	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3004	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3005	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3006	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3007	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3008	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3009	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3014	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3015	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3017	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3018	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3021	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3022	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3026	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3027	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3028	NRSA02J-221X	MG RESISTOR	220Ω,1/10W
		R3029	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3032	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3035	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3043	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3044	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3046	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3056	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3057	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3058	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3059	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3060	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3061	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3062	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3063	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3081	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3082	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3083	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3084	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3085	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3086	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3090	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3091	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3092	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3094	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R3095	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3096	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3097	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3098	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R3201	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		R3202	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3203	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3204	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R3205	NRSA02J-562X	MG RESISTOR	5.6kΩ,1/10W
		R3206	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3207	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3208	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3209	QRE141J-181Y	RESISTOR	180Ω,1/4W
		R3210	QRE141J-183Y	RESISTOR	18kΩ,1/4W
		R3211	NRSA02J-183X	MG RESISTOR	18kΩ,1/10W
		R3212	NRSA02J-181X	MG RESISTOR	180Ω,1/10W
		R3213	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R3214	NRSA02J-181X	MG RESISTOR	180Ω,1/10W
		R3215	NRSA02J-273X	MG RESISTOR	27kΩ,1/10W
		R3216	QRE141J-474Y	RESISTOR	470kΩ,1/4W
		R3217	QRE141J-334Y	RESISTOR	330kΩ,1/4W
		R3219	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3220	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3222	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3223	NRSA02J-105X	MG RESISTOR	1MΩ,1/10W
		R3224	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R3226	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3227	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3232	NRSA02J-104X	MG RESISTOR	100kΩ,1/10W
		R3233	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R3234	QRE141J-472Y	RESISTOR	4.7kΩ,1/4W
		R3237	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R3238	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R4001	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R4002	NRSA02J-223X	MG RESISTOR	22kΩ,1/10W
		R4003	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R4004	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R4006	NRSA02J-392X	MG RESISTOR	3.9kΩ,1/10W
		R4010	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R4011	NRSA02J-471X	MG RESISTOR	470Ω,1/10W
		R4012	NRSA02J-153X	MG RESISTOR	15kΩ,1/10W
		R4013	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4018	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R4019	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4020	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R4021	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R4022	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R4024	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R4025	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
	⚠	R5001	QRZ9046-475Z	RESISTOR	4.7MΩ,1/2W
		R5101	QRE141J-224Y	RESISTOR	220kΩ,1/4W
		R5102	QRE141J-224Y	RESISTOR	220kΩ,1/4W
		R5103	QRE141J-683Y	RESISTOR	68kΩ,1/4W
		R5104	QRG02GJ-683	OMF RESISTOR	68kΩ,2W
		R5106	QRT01DJ-R39X	MF RESISTOR	0.39Ω,1W
		R5107	QRE121J-561Y	RESISTOR	560Ω,1/2W
		R5108	NRSA02J-152X	MG RESISTOR	1.5kΩ,1/10W
		R5109	NRSA02J-681X	MG RESISTOR	680Ω,1/10W
		R5110	NRSA02J-224X	MG RESISTOR	220kΩ,1/10W
		R5302	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R5303	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
	⚠	R5304	QRZ9005-221X	FUSI RESISTOR	220Ω,1/4W
		R5305	QRE141J-471Y	RESISTOR	470Ω,1/4W
		R5306	NRSA02J-333X	MG RESISTOR	33kΩ,1/10W
		R5324	QRE141J-102Y	RESISTOR	1kΩ,1/4W
		R6030	NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		R6031	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6032	NRSA02J-123X	MG RESISTOR	12kΩ,1/10W
		R6033	NRSA02J-123X	MG RESISTOR	12kΩ,1/10W
		R6053	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R6501	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R6502	NRSA02J-334X	MG RESISTOR	330kΩ,1/10W
		R6503	NRSA02J-124X	MG RESISTOR	120kΩ,1/10W
		R6504	NRSA02J-302X	MG RESISTOR	3kΩ,1/10W
		R6505	NRSA02J-512X	MG RESISTOR	5.1kΩ,1/10W
		R6506	NRSA02J-333X	MG RESISTOR	33kΩ,1/10W
		R6507	NRSA02J-333X	MG RESISTOR	33kΩ,1/10W
		R6508	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R6509	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R6510	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R6511	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R6514	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6515	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R6551	NRSA02J-271X	MG RESISTOR	270Ω,1/10W
		R6552	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7001	QRE141J-471Y	RESISTOR	470Ω,1/4W
		R7002	QRE141J-471Y	RESISTOR	470Ω,1/4W
		R7003	QRE141J-471Y	RESISTOR	470Ω,1/4W
		R7004	QRE141J-471Y	RESISTOR	470Ω,1/4W
		R7005	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7006	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7007	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7008	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7011	NRSA02J-393X	MG RESISTOR,VP670U/U(C)	39kΩ,1/10W
		R7012	NRSA02J-393X	MG RESISTOR,VP672U/VP673U/U(C)	39kΩ,1/10W
		R7013	QRE141J-103Y	RESISTOR	10kΩ,1/4W
		R7014	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		R7017	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7020	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7021	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R7022	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R7023	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7024	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R7025	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R7026	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R7030	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7031	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R7032	NRSA02J-182X	MG RESISTOR	1.8kΩ,1/10W
		R7033	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7034	NRSA02J-272X	MG RESISTOR	2.7kΩ,1/10W
		R7035	NRSA02J-472X	MG RESISTOR	4.7kΩ,1/10W
		R7036	NRSA02J-682X	MG RESISTOR	6.8kΩ,1/10W
		R7037	NRSA02J-563X	MG RESISTOR	56kΩ,1/10W
		R7404	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		R7410	NRSA02J-393X	MG RESISTOR	39kΩ,1/10W
		R7421	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R7422	NRSA02J-103X	MG RESISTOR	10kΩ,1/10W
		R7427	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7428	NRSA02J-153X	MG RESISTOR	15kΩ,1/10W
		R7429	NRSA02J-122X	MG RESISTOR	1.2kΩ,1/10W
		R7430	NRSA02J-102X	MG RESISTOR	1kΩ,1/10W
		R7431	NRSA02J-271X	MG RESISTOR	270Ω,1/10W
		R7437	NRSA02J-101X	MG RESISTOR	100Ω,1/10W
		R7438	NRSA02J-332X	MG RESISTOR	3.3kΩ,1/10W
		R7439	NRSA02J-222X	MG RESISTOR	2.2kΩ,1/10W
		R7440	NRSA02J-473X	MG RESISTOR	47kΩ,1/10W
		C1	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C3	NCF21CZ-105X	CAPACITOR	1μF,16V
		C5	NCF21CZ-105X	CAPACITOR	1μF,16V
		C7	QEKC0JM-107	E CAPACITOR	100μF,6.3V
		C9	NCF21CZ-105X	CAPACITOR	1μF,16V
		C11	NCF21CZ-105X	CAPACITOR	1μF,16V
		C12	NCB21EK-473X	CAPACITOR	0.047μF,25V
		C13	QEKJ1HM-335	E CAPACITOR	3.3μF,50V
		C14	NCB21EK-333X	CAPACITOR	0.033μF,25V
		C17	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C18	NDC21HJ-561X	CAPACITOR	560pF,50V
		C20	QEKJ1HM-225	E CAPACITOR	2.2μF,50V
		C21	NCB21HK-472X	CAPACITOR	0.0047μF,50V
		C23	NCB21EK-223X	CAPACITOR	0.022μF,25V
		C24	NCB21CK-474X	CAPACITOR	0.47μF,16V
		C25	NCB21HK-683X	CAPACITOR	0.068μF,50V
		C29	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
		C31	NRSA02J-0R0X	MG RESISTOR	0Ω,1/10W
		C32	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C34	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C36	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C37	QEKJ0JM-107	E CAPACITOR	100μF,6.3V
		C38	NDC21HJ-240X	CAPACITOR	24pF,50V
		C40	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C41	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C42	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C43	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C45	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C48	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C49	NDC21HJ-331X	CAPACITOR	330pF,50V
		C51	QEKJ1HM-105	E CAPACITOR	1μF,50V
		C52	QEKJ1HM-105	E CAPACITOR	1μF,50V
		C54	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
		C55	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C56	QEKJ1HM-335	E CAPACITOR	3.3μF,50V
		C57	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C58	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C59	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C60	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C61	NDC21HJ-330X	CAPACITOR	33pF,50V
		C62	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C63	NDC21HJ-151X	CAPACITOR	150pF,50V
		C64	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C65	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C66	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C67	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C68	QETN0JM-477	E CAPACITOR	470μF,6.3V
		C98	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C107	NDC21HJ-4R0X	CAPACITOR	4pF,50V
		C108	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C125	NDC21HJ-8R0X	CAPACITOR	8pF,50V
		C134	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C135	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C136	NCB11EK-104X	CAPACITOR	0.1μF,25V
		C201	QERF0JM-107	E CAPACITOR	100μF,6.3V
		C202	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C203	QERF1HM-105	E CAPACITOR	1μF,50V
		C205	QCBB1HJ-101	CAPACITOR	100pF,50V
		C207	NCF21CZ-105X	CAPACITOR	1μF,16V
		C2001	NCF21CZ-105X	CAPACITOR	1μF,16V
		C2002	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C2003	NCB21HK-123X	CAPACITOR	0.012μF,50V

#	⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
		C2004	QEKJ1CM-226	E CAPACITOR	22μF,16V
		C2005	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C2007	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C2008	NCB21HK-152X	CAPACITOR	0.0015μF,50V
		C2009	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
		C2010	QEKC1EM-475	E CAPACITOR	4.7μF,25V
		C2013	NCB21EK-333X	CAPACITOR	0.033μF,25V
		C2015	QEKJ1CM-226	E CAPACITOR	22μF,16V
		C2016	QEKC1HM-475	E CAPACITOR	4.7μF,50V
		C2051	NCB21HK-331X	CAPACITOR	330pF,50V
		C2052	QFV61HJ-823	F CAPACITOR	0.082μF,50V
		C2053	NCB21HK-472X	CAPACITOR	0.0047μF,50V
		C2054	NCB21HK-223X	CAPACITOR	0.022μF,50V
		C2055	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C2151	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C2204	QEKJ1CM-226	E CAPACITOR	22μF,16V
		C2205	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
		C2206	QEKC1HM-475	E CAPACITOR	4.7μF,50V
		C2207	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C2208	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C2209	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C2210	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C2211	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C2212	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C2213	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C2214	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C2215	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C2218	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C2219	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C2220	QEKJ1CM-476	E CAPACITOR	47μF,16V
		C2221	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C2222	QEKJ1CM-226	E CAPACITOR	22μF,16V
		C2225	QEKJ1HM-224	E CAPACITOR	0.22μF,50V
		C2230	NCB21HK-473X	CAPACITOR	0.047μF,50V
		C2231	NCB21HK-153X	CAPACITOR	0.015μF,50V
		C2232	QEKJ1HM-224	E CAPACITOR	0.22μF,50V
		C2233	NCB21HK-153X	CAPACITOR	0.015μF,50V
		C2234	NCB21HK-473X	CAPACITOR	0.047μF,50V
		C2251	NCB21CK-104X	CAPACITOR	0.1μF,16V
		C2252	NCB21HK-222X	CAPACITOR	0.0022μF,50V
		C2253	NCB21HK-222X	CAPACITOR	0.0022μF,50V
		C2257	QEKC0JM-476	E CAPACITOR	47μF,6.3V
		C2258	NCB21CK-104X	CAPACITOR	0.1μF,16V
		C2259	NCB21CK-104X	CAPACITOR	0.1μF,16V
		C2261	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C2262	NDC21HJ-101X	CAPACITOR	100pF,50V
		C3001	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C3002	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C3003	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C3013	QEKJ1CM-106	E CAPACITOR	10μF,16V
		C3015	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C3016	NDC21HJ-220X	CAPACITOR	22pF,50V
		C3017	NDC21HJ-220X	CAPACITOR	22pF,50V
		C3019	NDC21HJ-200X	CAPACITOR	20pF,50V
		C3020	NDC21HJ-180X	CAPACITOR	18pF,50V
		C3022	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C3023	NCF21CZ-105X	CAPACITOR	1μF,16V
		C3024	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C3025	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C3028	QETL0JM-338	E CAPACITOR	3300μF,6.3V
		C3029	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C3030	QEKJ0JM-227	E CAPACITOR	220μF,6.3V
		C3035	NCB21HK-103X	CAPACITOR	0.01μF,50V
		C3036	QEKJ0JM-107	E CAPACITOR	100μF,6.3V
		C4001	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C4002	QERF1HM-224	E CAPACITOR	0.22μF,50V
		C4004	QERF0JM-226	E CAPACITOR	22μF,6.3V
		C4006	NCB21EK-563X	CAPACITOR	0.056μF,25V
		C4007	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C4008	QERF0JM-107	E CAPACITOR	100μF,6.3V
		C4009	NCB21HK-102X	CAPACITOR	0.001μF,50V
		C4010	QERF0JM-476	E CAPACITOR	47μF,6.3V
		C4011	NCB21CK-224X	CAPACITOR	0.22μF,16V
		C4012	NDC21HJ-471X	CAPACITOR	470pF,50V
		C4014	NDC21HJ-101X	CAPACITOR	100pF,50V
		C4015	NDC21HJ-101X	CAPACITOR	100pF,50V
		C4016	QEKJ0JM-476	E CAPACITOR	47μF,6.3V
		C4017	NCB21HJ-103X	CAPACITOR	0.01μF,50V
		C4019	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C4022	NDC21HJ-101X	CAPACITOR	100pF,50V
	⚠	C5001	QFZ9051-473	F CAPACITOR	0.047μF,250V
	⚠	C5004	QCZ9073-472	CAPACITOR	0.0047μF,400V
	⚠	C5006	QETM2DM-826	E CAPACITOR	82μF,200V
		C5101	QCZ0212-472	CAPACITOR	0.0047μF,1kV
		C5102	QCZ0136-101Z	CAPACITOR	100pF,1kV
		C5103	NCB21HK-331X	CAPACITOR	330pF,50V
		C5104	QETN1HM-105	E CAPACITOR	1μF,50V
		C5105	QFLC1HJ-183Z	F CAPACITOR	0.018μF,50V
		C5107	QFV91HJ-104	F CAPACITOR	0.1μF,50V
		C5201	QEMU0JM-227	E CAPACITOR	220μF,6.3V
		C5202	QEMT1CM-827	E CAPACITOR	820μF,16V
		C5203	QEMT1AM-687	E CAPACITOR	680μF,10V
		C5204	QETN2AM-475	E CAPACITOR	4.7μF,100V
		C5205	QETN1HM-106	E CAPACITOR	10μF,50V
		C5207	QETN1CM-227	E CAPACITOR	220μF,16V
		C5208	QETN1AM-227	E CAPACITOR	220μF,10V
		C5301	QEMU0JM-227	E CAPACITOR	220μF,6.3V
		C5302	QETN1HM-106	E CAPACITOR	10μF,50V
		C5303	QETN1CM-107	E CAPACITOR	100μF,16V
		C5304	QFLC1HJ-183Z	F CAPACITOR	0.018μF,50V
		C5305	NCF21HZ-103X	CAPACITOR	0.01μF,50V
		C6006	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C6008	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C6024	NCB21EK-563X	CAPACITOR	0.056μF,25V
		C6031	QETN1HM-106	E CAPACITOR	10μF,50V
		C6501	QETN1CM-226	E CAPACITOR	22μF,16V
		C6502	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C6503	QEKJ1HM-105	E CAPACITOR	1μF,50V
		C6504	QEKJ1EM-475	E CAPACITOR	4.7μF,25V
		C6505	QETN1HM-106	E CAPACITOR	10μF,50V
		C6506	QEKJ1HM-104	E CAPACITOR	0.1μF,50V
		C6507	NCB21EK-473X	CAPACITOR	0.047μF,25V
		C6508	QETN1HM-474	E CAPACITOR	0.47μF,50V
		C6509	NCB21EK-104X	CAPACITOR	0.1μF,25V
		C6510	QEKJ1HM-105	E CAPACITOR	1μF,50V
		C6511	QEKJ1HM-105	E CAPACITOR	1μF,50V
		C6512	QEKJ1HM-105	E CAPACITOR	1μF,50V
		C6513	QEE81CJ-335	T CAPACITOR	3.3μF,16V
		C6514	QEE81CJ-106	T CAPACITOR	10μF,16V
		C6515	QETN1HM-105	E CAPACITOR	1μF,50V
		C6516	QEKJ1HM-106	E CAPACITOR	10μF,50V
		C6517	QEKJ1HM-106	E CAPACITOR	10μF,50V

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	C6518	QETN1HM-105	E CAPACITOR	1µF,50V
	C6519	NCB21HK-822X	CAPACITOR	0.0082µF,50V
	C6520	NCB21HK-822X	CAPACITOR	0.0082µF,50V
	C7001	QDGB1HK-102Y	CAPACITOR	0.001µF,50V
	C7002	QEKJ1HM-106	E CAPACITOR	10µF,50V
	C7007	QEKJ0JM-476	E CAPACITOR	47µF,6.3V
	C7008	NCB21EK-223X	CAPACITOR	0.022µF,25V
	C7009	NDC21HJ-220X	CAPACITOR	22pF,50V
	C7010	NCB21EK-104X	CAPACITOR	0.1µF,25V
	C7011	QEKJ0JM-227	E CAPACITOR	220µF,6.3V
	C7401	QDYB1CM-103Y	CAPACITOR	0.01µF,16V
	C7402	QERF0JM-476	E CAPACITOR	47µF,6.3V
	C7403	QFLA1HJ-272Z	F CAPACITOR	0.0027µF,50V
	C7406	NCB21HK-222X	CAPACITOR	0.0022µF,50V
	C7407	NCB21HK-103X	CAPACITOR	0.01µF,50V
	C7411	QDYB1CM-103Y	CAPACITOR	0.01µF,16V
	C7415	QFVF1HJ-224Z	F CAPACITOR	0.22µF,50V
	C7416	NCB21HK-103X	CAPACITOR	0.01µF,50V
	C7417	NCB21HK-103X	CAPACITOR	0.01µF,50V
	C7419	NCB21EK-104X	CAPACITOR	0.1µF,25V
	C7420	NDC21HJ-390X	CAPACITOR	39pF,50V
	C7421	QERF1HM-105	E CAPACITOR	1µF,50V
	C7425	NCB21HK-102X	CAPACITOR	0.001µF,50V
	C7426	QERF1HM-225	E CAPACITOR	2.2µF,50V
	C7427	NCF21EZ-104X	CAPACITOR	0.1µF,25V
	C7430	NCB21HK-562X	CAPACITOR	0.0056µF,50V
	C7431	NCB21HK-473X	CAPACITOR	0.047µF,50V
	C7432	QDVB1EZ-223Y	CAPACITOR	0.022µF,25V
	C7437	NCB21EK-104X	CAPACITOR	0.1µF,25V
	L1	QQL29BJ-100Z	COIL	10µH
	L2	QQL29BJ-221Z	COIL	220µH
	L4	QQL29BJ-100Z	COIL	10µH
	L5	QQL231J-121Y	COIL	120µH
	L7	QQL29BJ-2R2Z	COIL	2.2µH
	L8	QQL29BJ-101Z	COIL	100µH
	L9	QQL29BJ-100Z	COIL	10µH
	L10	QQL29BJ-100Z	COIL	10µH
⚠	L17	QQL01BJ-120Z	COIL	12µH
	L201	QQL29BJ-100Z	COIL	10µH
	L203	QQL231J-4R7Y	COIL	4.7µH
	L2001	QQL29BJ-100Z	COIL	10µH
	L2251	QQL29BJ-100Z	COIL	10µH
	L5201	PELN0640-330KZ	COIL	33µH
	L5202	PELN0640-330KZ	COIL	33µH
⚠	L5301	QQL01BK-101Z	COIL	100µH
	L7401	QQL29BJ-100Z	COIL	10µH
	L7402	QQL231J-470Y	COIL	47µH
	X2	QAX0435-001	CRYSTAL RESONATOR	
	X3001	QAX0526-001	CRYSTAL RESONATOR	
	X3002	QAX0444-001	CRYSTAL RESONATOR	
	S3001	QSW0602-003	PUSH SWITCH,REC SAFETY	
	S6050	PESW0701	SLIDE SWITCH	
	S7001	QSW0456-002Z	TACT SWITCH,POWER	
	S7002	QSW0456-002Z	TACT SWITCH,MENU	
	S7004	QSW0456-002Z	TACT SWITCH,CH-	
	S7006	QSW0456-002Z	TACT SWITCH,CH+	
	S7008	QSW0456-002Z	TACT SWITCH,REVIEW	
	S7010	QSW0456-002Z	TACT SWITCH,REC	
	S7011	QSW0456-002Z	TACT SWITCH,REW	
	S7012	QSW0456-002Z	TACT SWITCH,STOP/EJECT	

# ⚠	REF No.	PART No.	PART NAME, DESCRIPTION	
	S7013	QSW0456-002Z	TACT SWITCH,PLAY	
	S7014	QSW0456-002Z	TACT SWITCH,PAUSE	
	S7015	QSW0456-002Z	TACT SWITCH,FF	
	S7016	QSW0456-002Z	TACT SWITCH,OK	
	K5101	QQR0678-001Z	FERRITE BEAD	
⚠	PC5101	PS2501-1	PH COUPLER	
	PS3001	GP3S123	IC(PHOTO SENSOR)	
	PS3002	GP3S123	IC(PHOTO SENSOR)	
	T2051	PELN0832	OSC TRANSFORMER	
⚠	T5001	QQS0030-001	SW TRANSFORMER	
	TU6001	QAU0113-001	TUNER	
	ET1	PQ21623-2	EARTH PLATE(RF)	
⚠	TB1	PQ21910-3	TERMINAL BOARD	
	SD1	LP30530-001B	SHIELD CASE(PRE)	
	DI7001	QLF0031-001	FL TUBE	
	HD1	PQ35479-1-4	HOLDER(FDP)	
	FL7401	PELN1137	LOW PASS FILTER	
	J2	QNN0286-002	PIN JACK,A/V OUT	
⚠	F5001	QMF51N2-1R25J1	FUSE	1.25A,AC250V
	FC5001	QNG0006-001Z	FUSE CLIP,F5001	
	FC5002	QNG0006-001Z	FUSE CLIP,F5001	
	J7101	QNN0287-001	PIN JACK,FRONT IN,VP670U/U(C)	
		QNN0288-001	PIN JACK,FRONT IN,VP672U/VP673U/U(C)	
⚠	LF5002	QQR0532-001	LINE FILTER	
⚠	SG5001	QAF0044-242Z	SURGE ABSORBER	
⚠	VA5001	QAF0023-431Z	VARISTOR	
⚠	VA5002	QAF0023-431Z	VARISTOR	
	CN1	QGF1028C1-11	FPC CONNECTOR,(1-11)U.DRUM	
	CN2001	QGF1207C1-07	FPC CONNECTOR,(1-7)A/C HEAD	
	CN2002	QGB2532J1-02	CONNECTOR,(1-2)FE HEAD	
	CN3001	QGB2015M2-08	CONNECTOR,(1-8)CAP MOTOR	
	CN3002	QGF1207C1-05	FPC CONNECTOR,(1-5)DRUM MDA	
	CN3003	QGB2532J1-02	CONNECTOR,(1-2)LOADING MOTOR	
	CN3004	QGB2534J2-04	CONNECTOR,(1-4)ROTARY ENCODER	
⚠	CN5001	QGA7901C3-02	CONNECTOR,(1-2)AC IN	
⚠	CP4001	ICP-N15	CIRCUIT PROTECTOR	
⚠	CP5302	ICP-N25	CIRCUIT PROTECTOR	

****

AUDIO CONTROL HEAD BOARD ASSEMBLY <12>

PW1	LPA10010-01A1	A/C HEAD BOARD ASSY
CN1	QGF1208F1-07	FPC CONNECTOR

****

LOADING MOTOR BOARD ASSEMBLY <55>

PW2	LPA10010-01A2	LOADING MOTOR BOARD ASSY
CN1	QGB2533K1-02	CONNECTOR